



Armed Forces College of Medicine AFCM



Veins of Lower Limb
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Lecturer of Anatomy

INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Describe beginning, termination, course and tributaries of superficial and deep veins of lower limb.
2. Predict clinical significance of veins of lower limb

Lecture Plan



1. Part 1 (5 min) Introduction
2. Part 2 (35 min) Main lecture
3. Part 3 (5 min) Summary
4. Lecture Quiz (5 min)

Key Points



1. Superficial veins of lower limb and their clinical significance

2. Deep veins of lower limb and their clinical significance

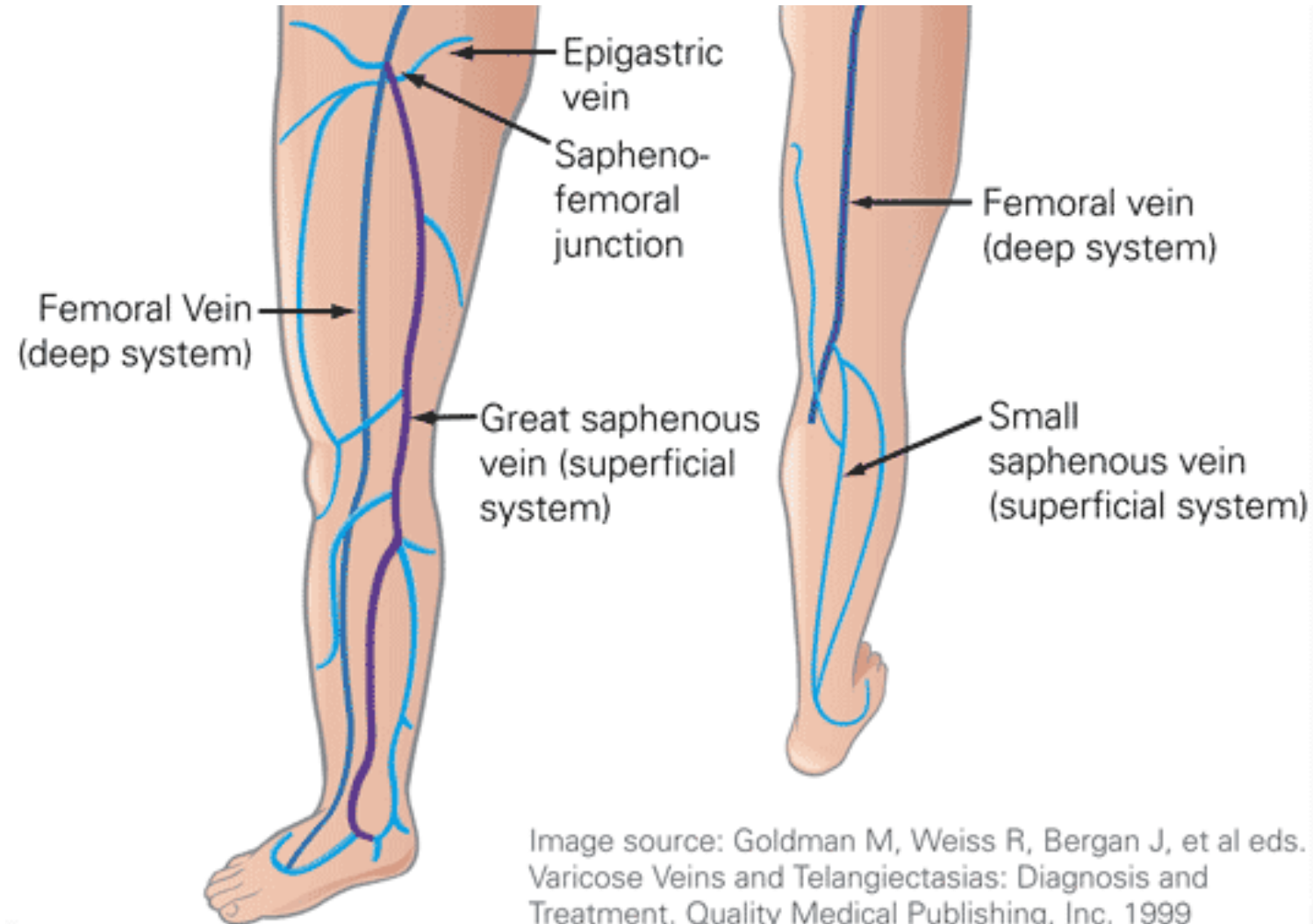
Veins of the Lower Limb



Two Divisions

1. Superficial limb veins

2. Deep limb veins



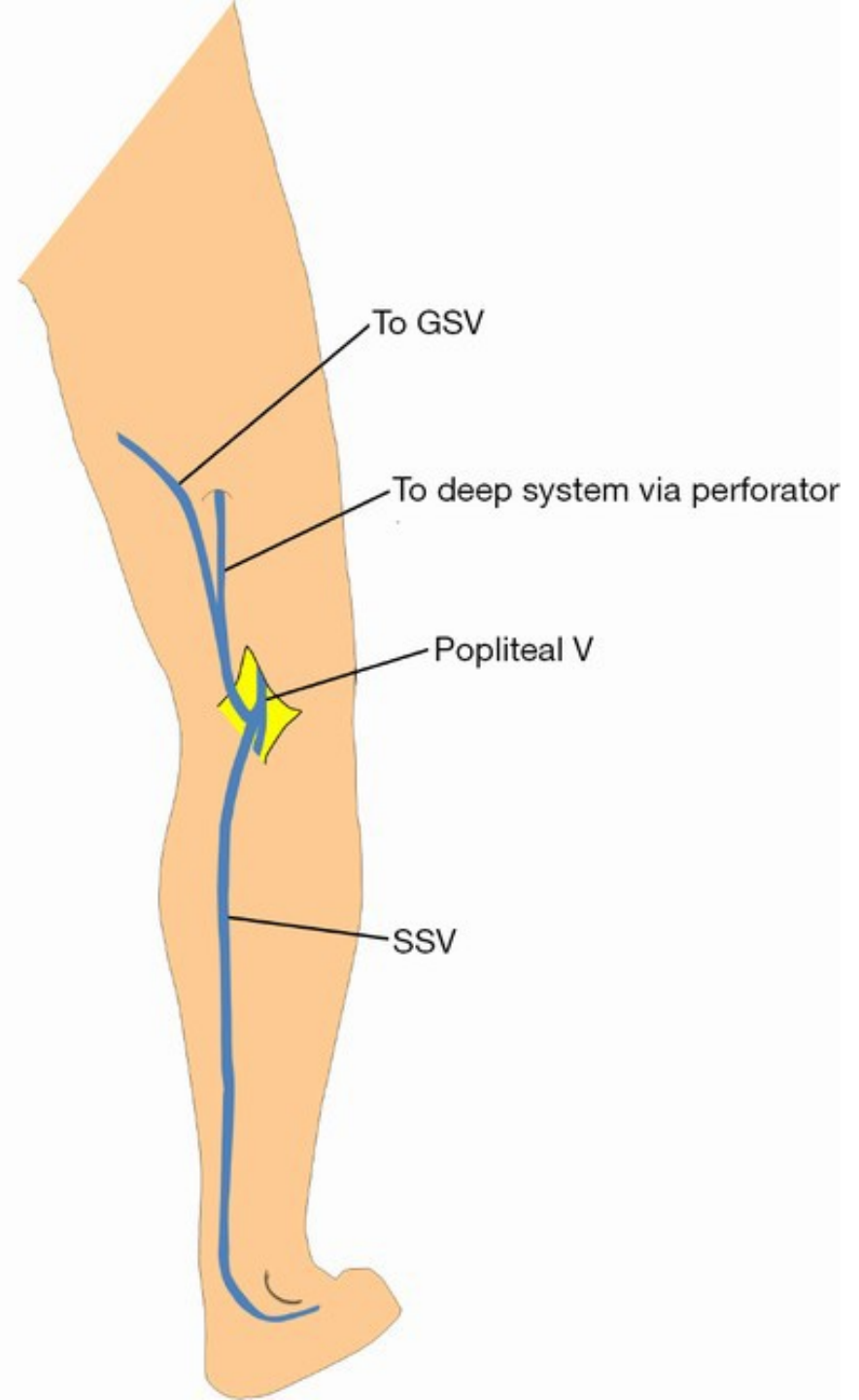
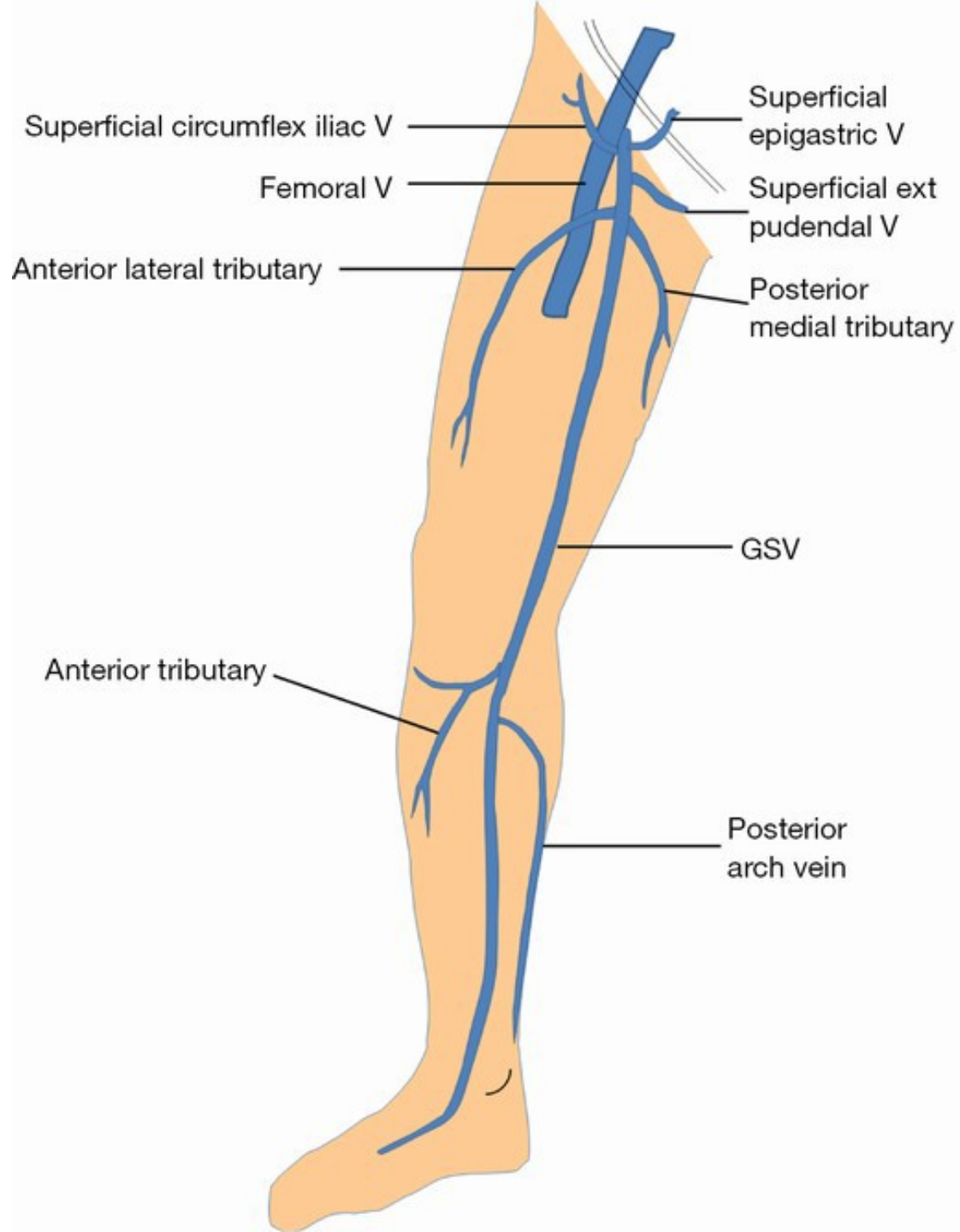
Superficial Veins of the LL



- Form a network in the subcutaneous tissue
- Pattern is variable

They are the tributaries of the:

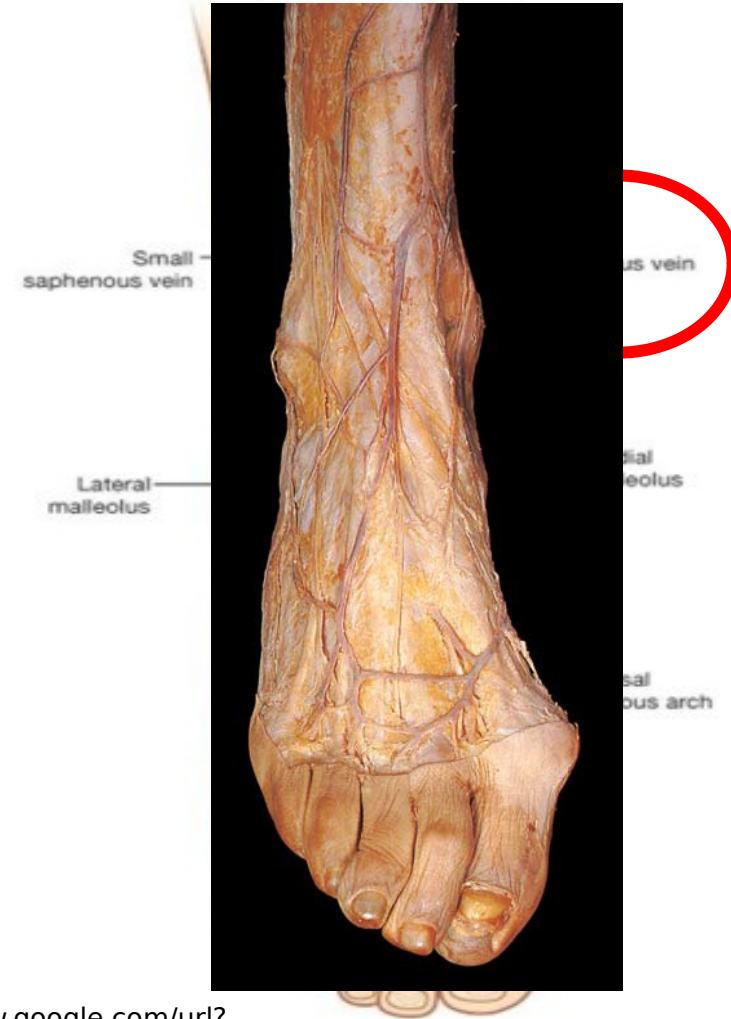
- 1. Great (long) saphenous vein*
- 2. Small (short) saphenous vein*



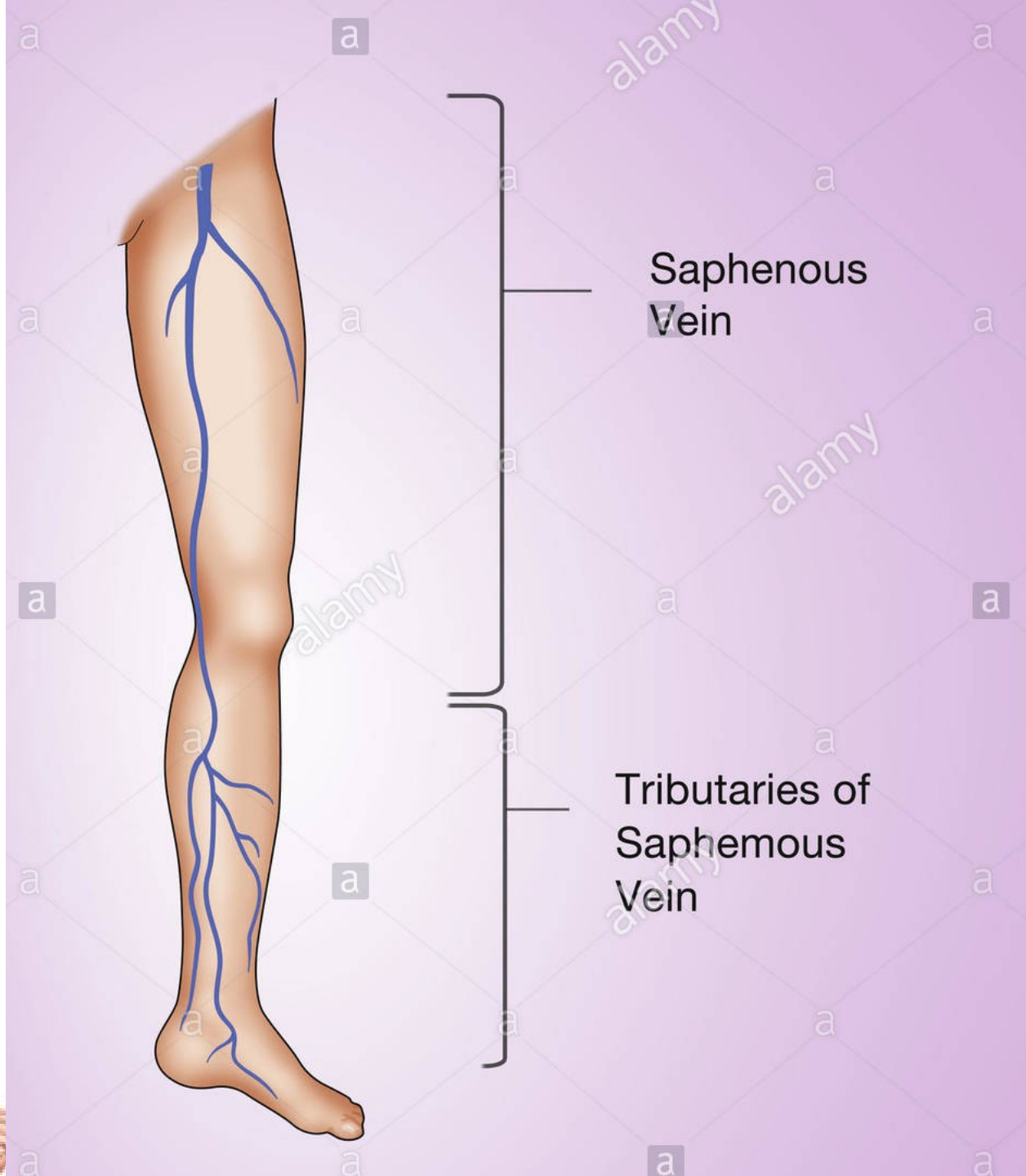
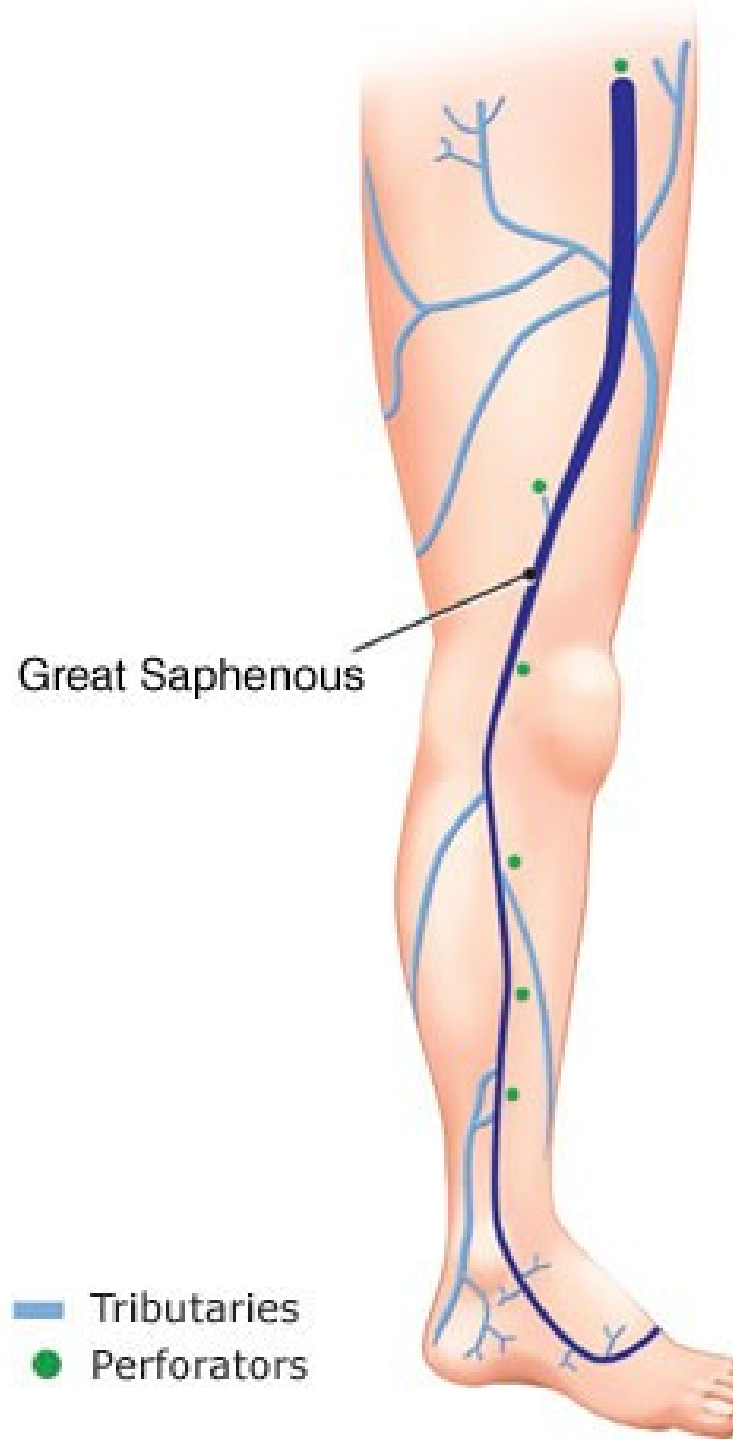
Great Saphenous vein



- **Great Saphenous Vein**
- The longest vein in the body
- Begins from the medial end of the dorsal venous arch of the foot, receiving Dorsal metatarsal & Dorsal digital veins
- Passes upward in front of the medial malleolus with the saphenous nerve.
- Then it ascends in accompany with the saphenous nerve in the superficial fascia over the medial side of the leg.



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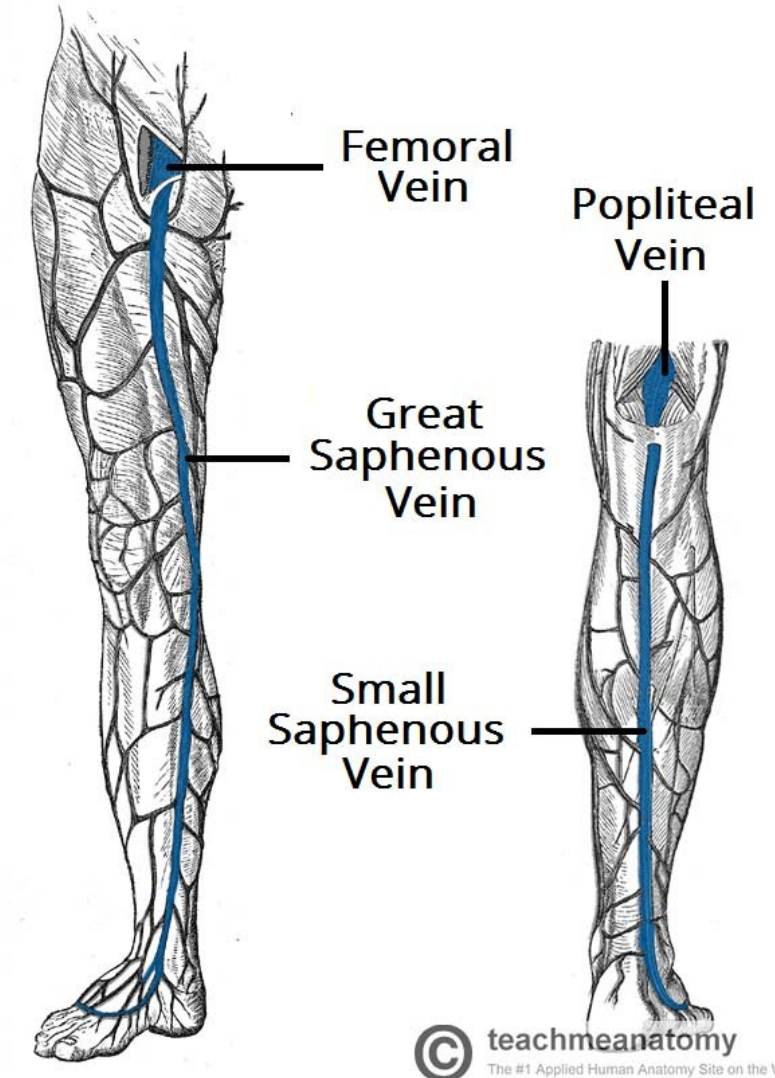


Course & Relations

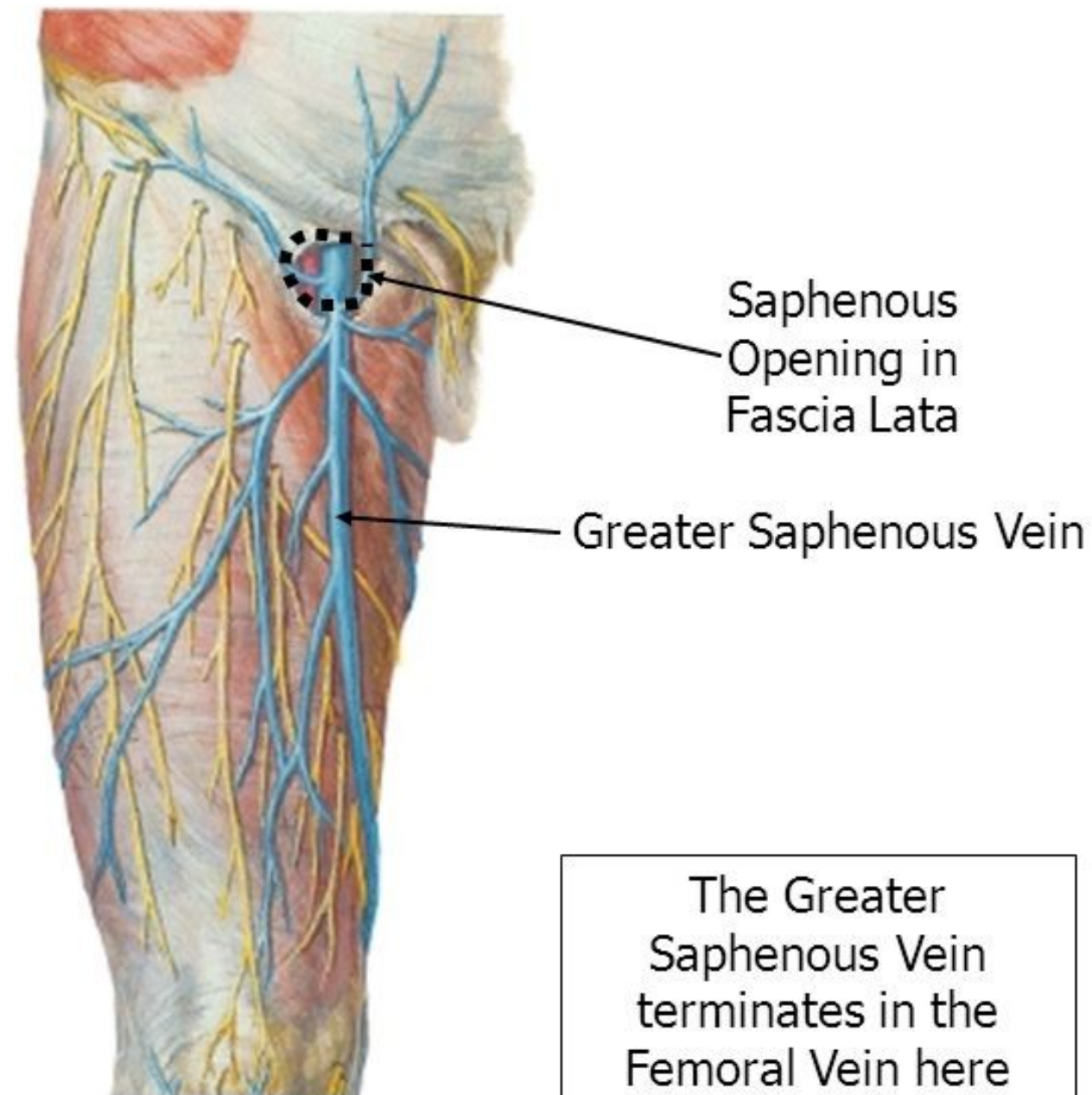
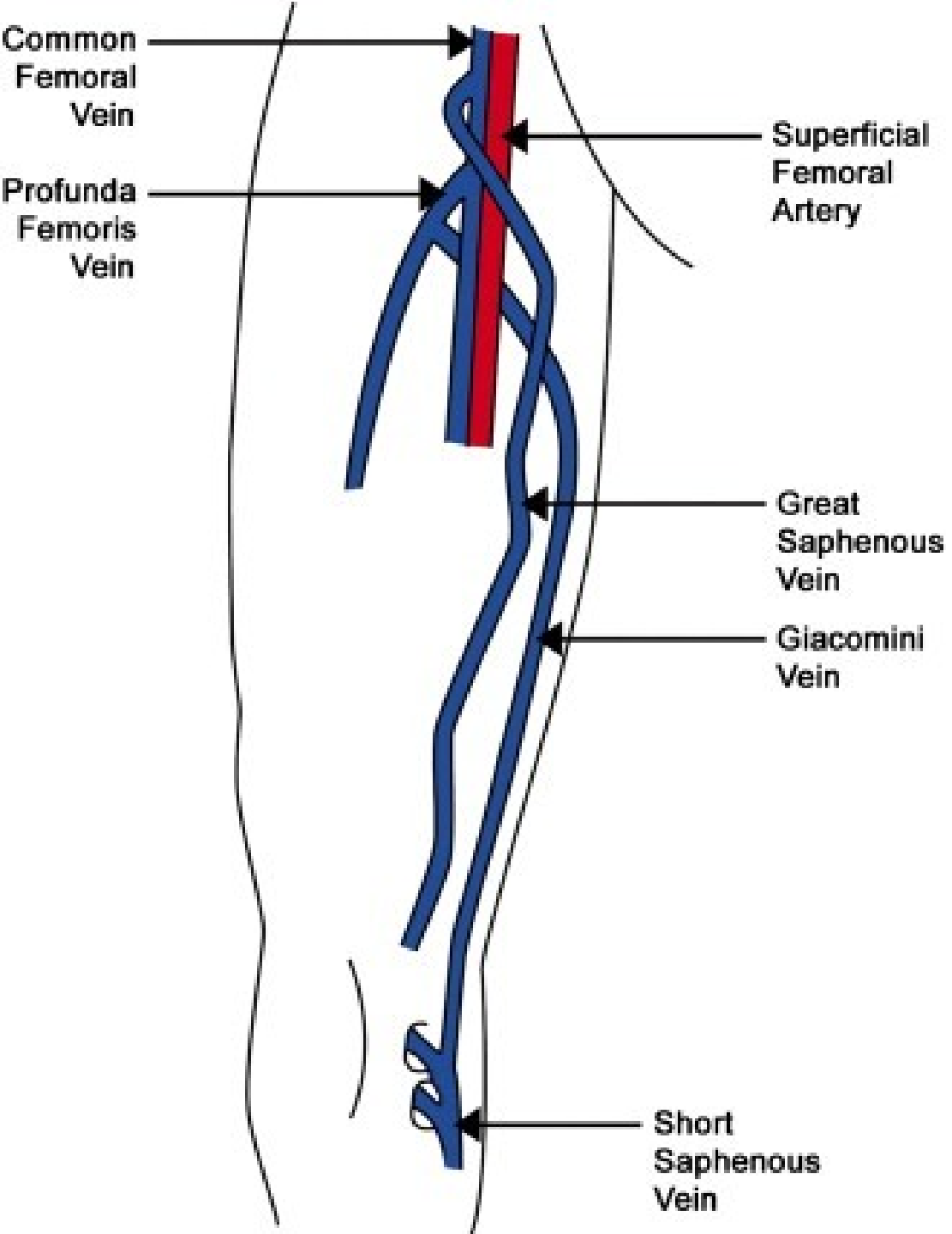


Great Saphenous Vein (Cont.)

- Ascends obliquely upwards and lies behind the medial border of the patella. Passes behind the knee and curves forward around the medial side of the thigh towards its front.
- Hooks through the lower part of the saphenous opening in the deep fascia to joins the femoral vein about 1.5 in. (4 cm) below and lateral to the pubic tubercle.



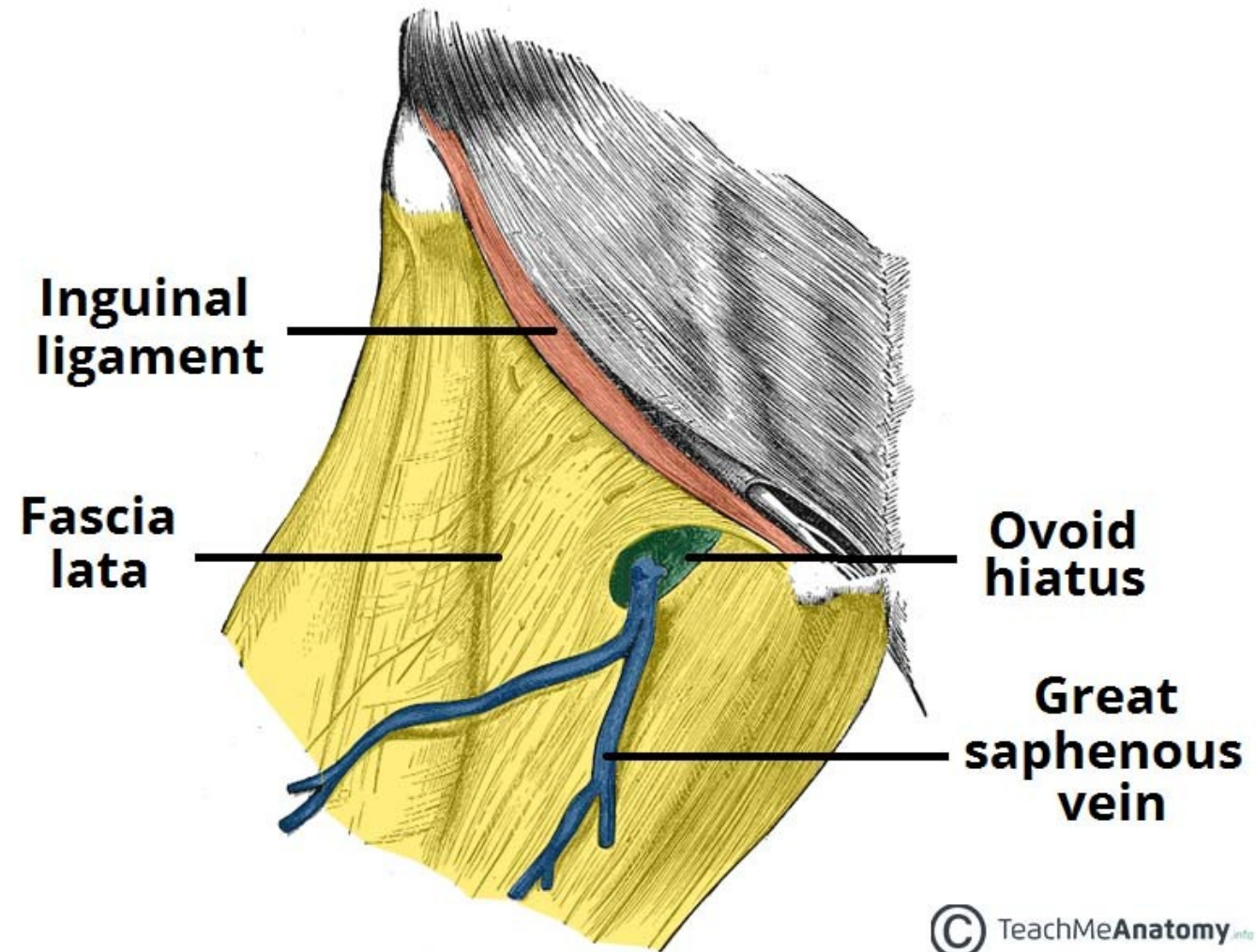
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Course & Relations



Pierce cribriform
fascia of saphenous
opening to end in
femoral vein



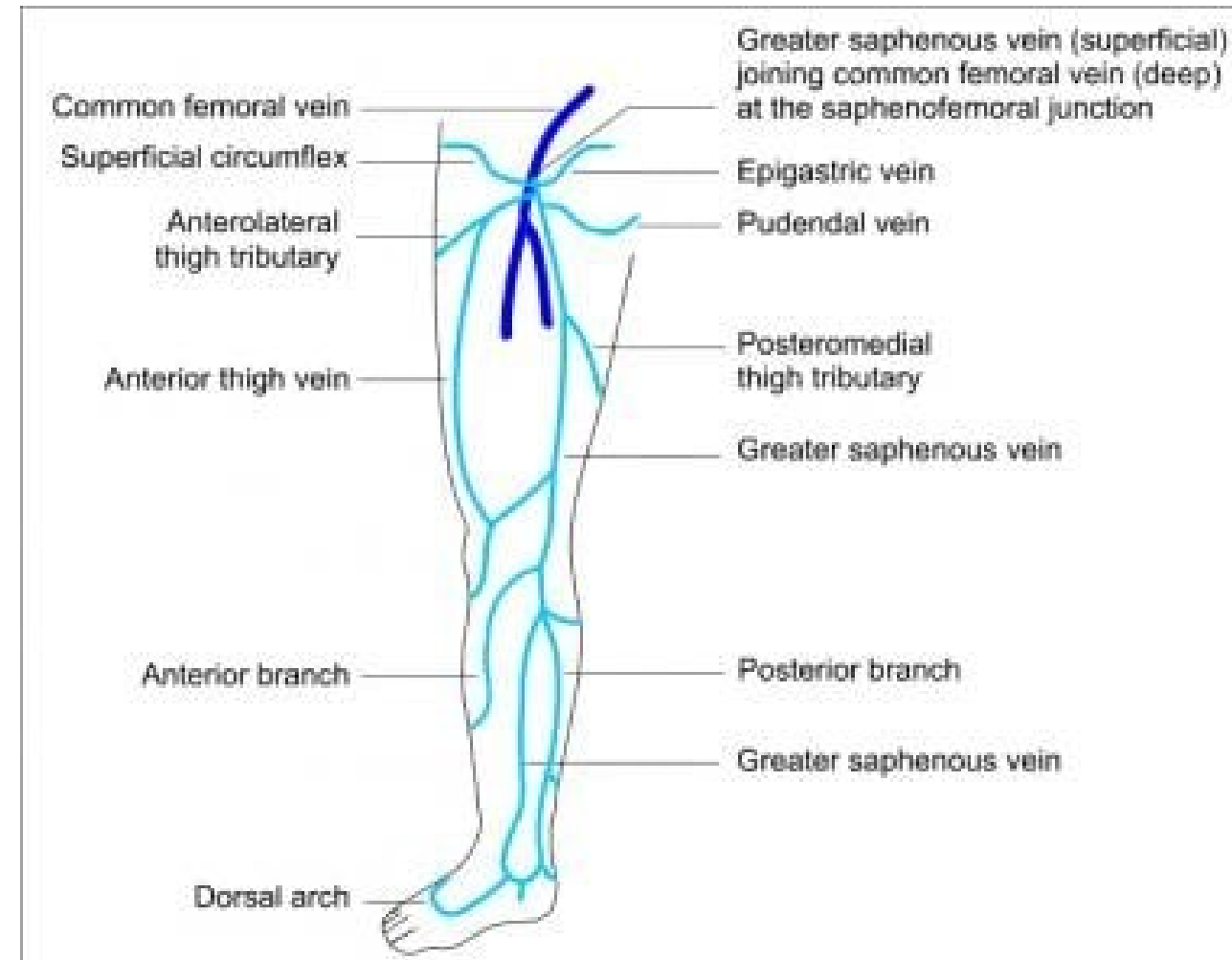
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Tributaries



- 1. Superficial circumflex iliac**
- 2. Superficial epigastric**
- 3. Superficial external pudendal**
- 4. Communicate with short saphenous**
- 5. Communicate with deep veins via perforating veins**



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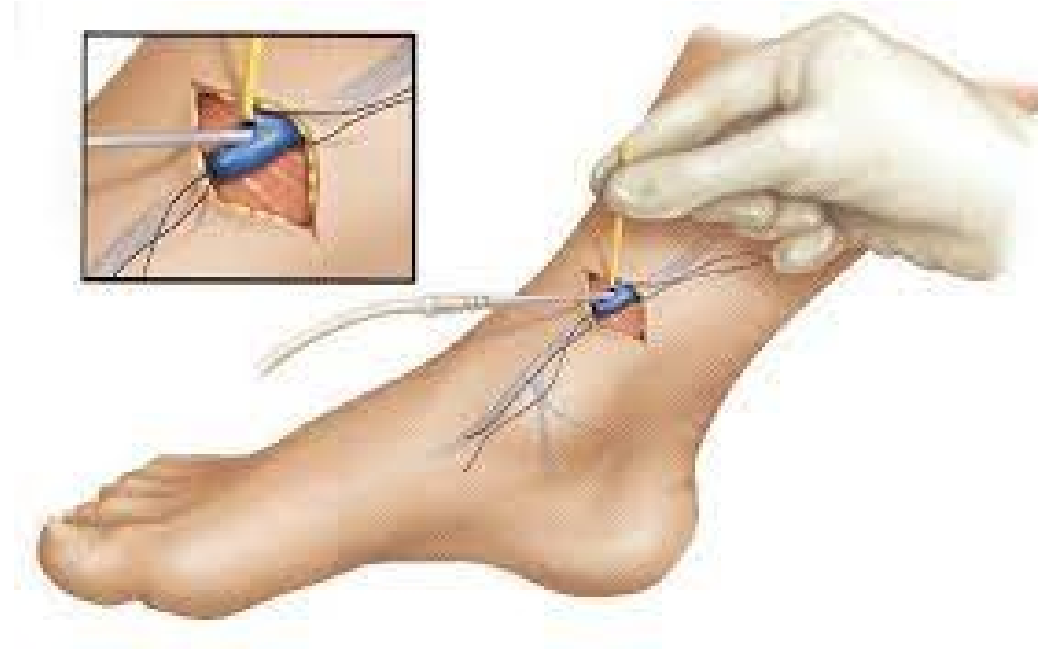
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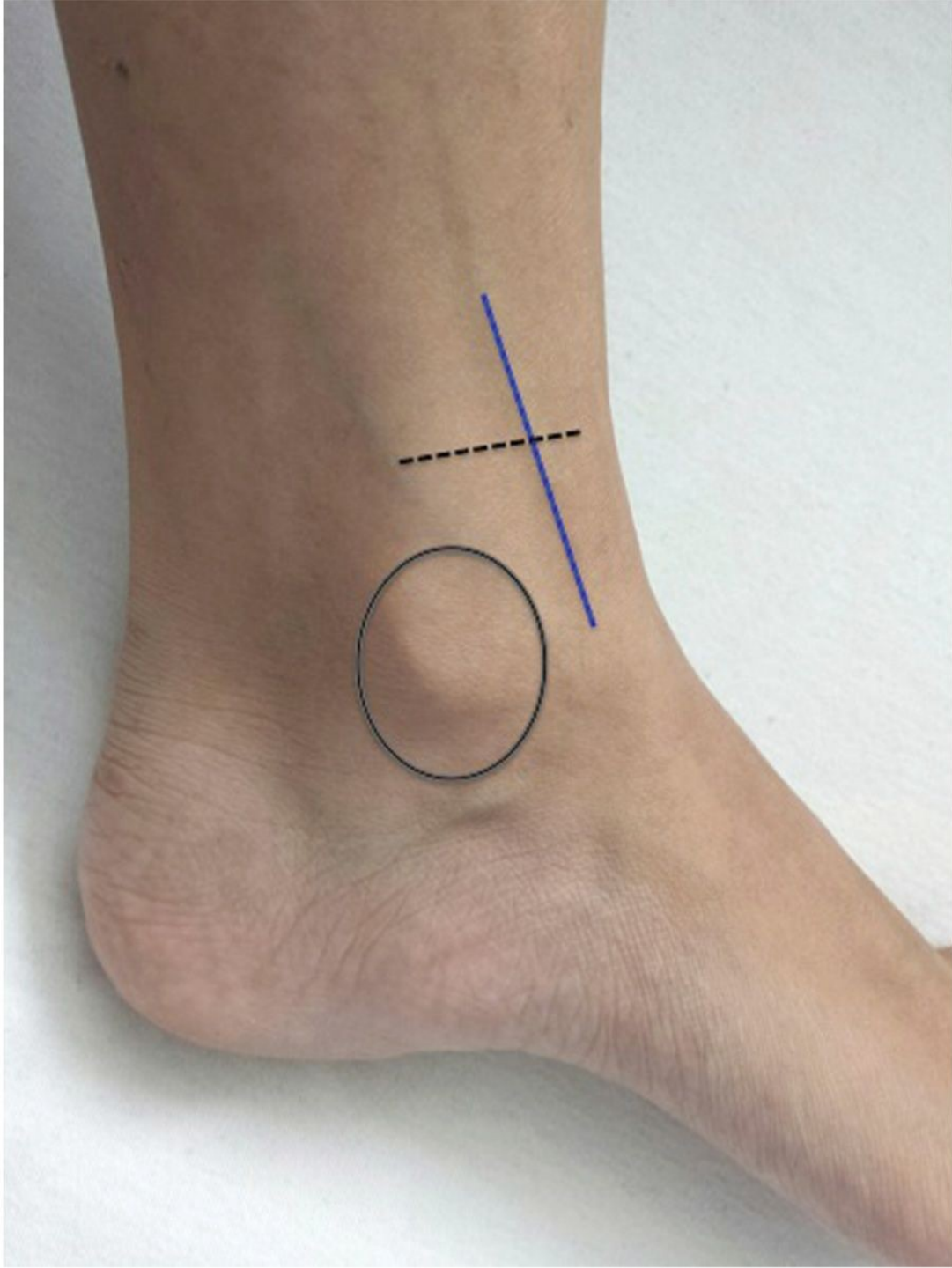
Venous Cutdown



An emergency procedure in which the vein is exposed surgically and then a cannula is inserted into the vein under direct vision.

It is used to get vascular access in **trauma and hypovolemic shock patients** when peripheral cannulation is difficult or impossible

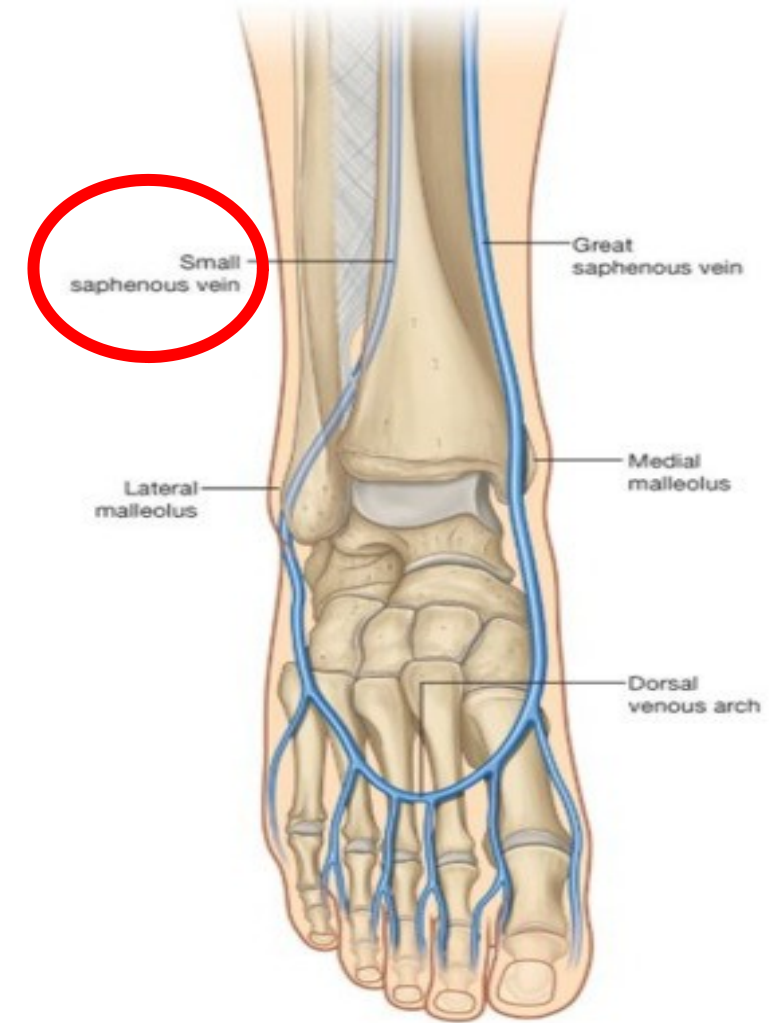




Small Saphenous Vein



- Arises from the lateral end of the dorsal venous arch. Ascends behind the lateral malleolus in company with the sural nerve.
- Follows the lateral border of the tendocalcaneus and then runs up to the middle of the back of the leg.
- Pierces the deep fascia in the lower part of the popliteal fossa

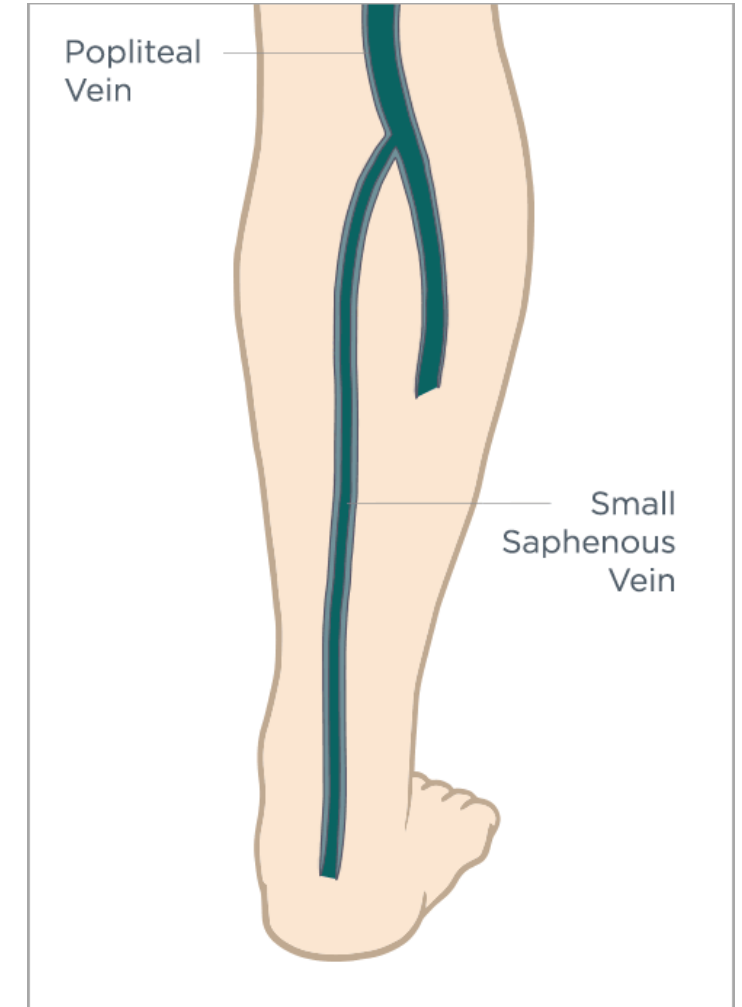


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Small Saphenous Vein



- Drains into the popliteal vein
- Has numerous valves along its course.
- Anastomosis freely with great saphenous vein.



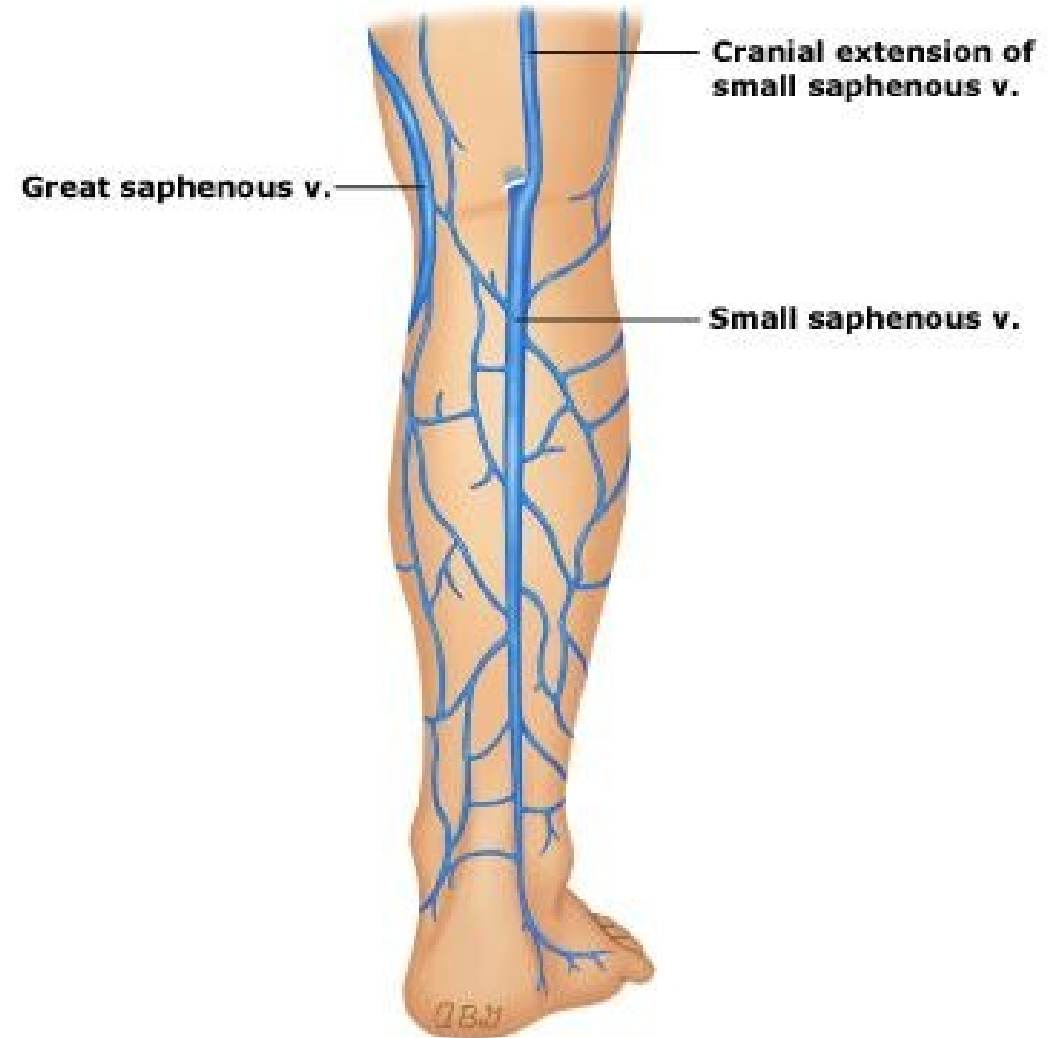
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Course and Relations



Pass in the **back of leg**
lateral to
tendocalcaneus then
towards **midline**

Pierce **deep popliteal**
fascia to **end in**
popliteal vein

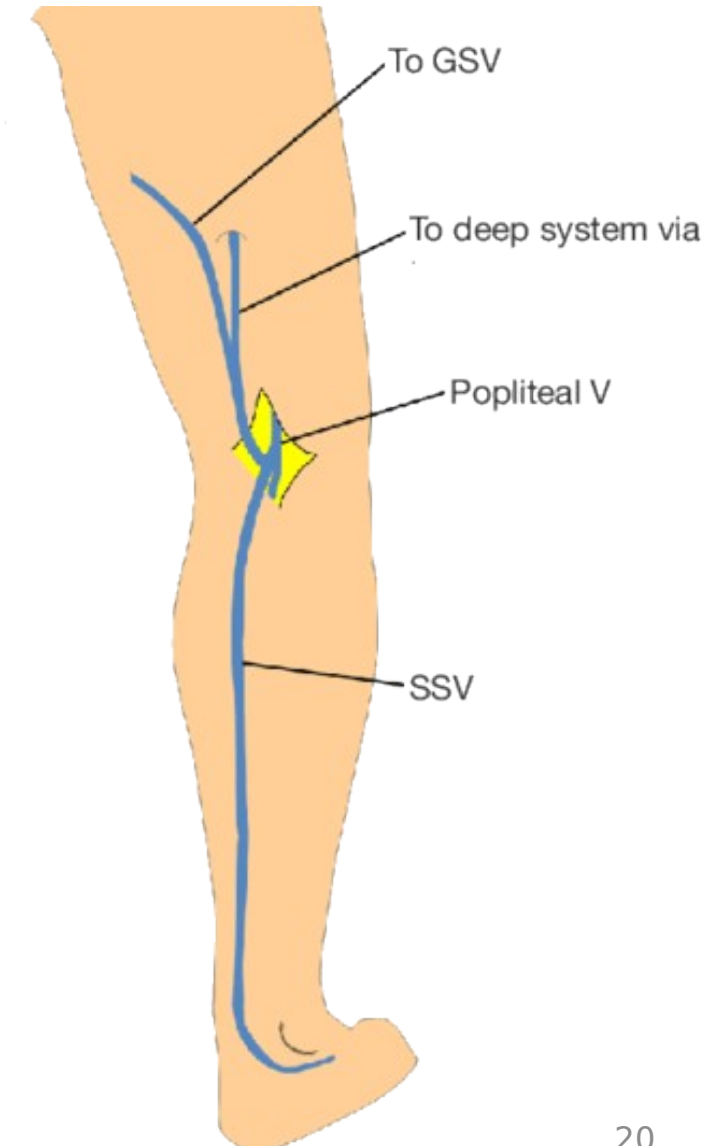


Tributaries



1. Communicate with great saphenous

2. Communicate with deep veins via perforating veins



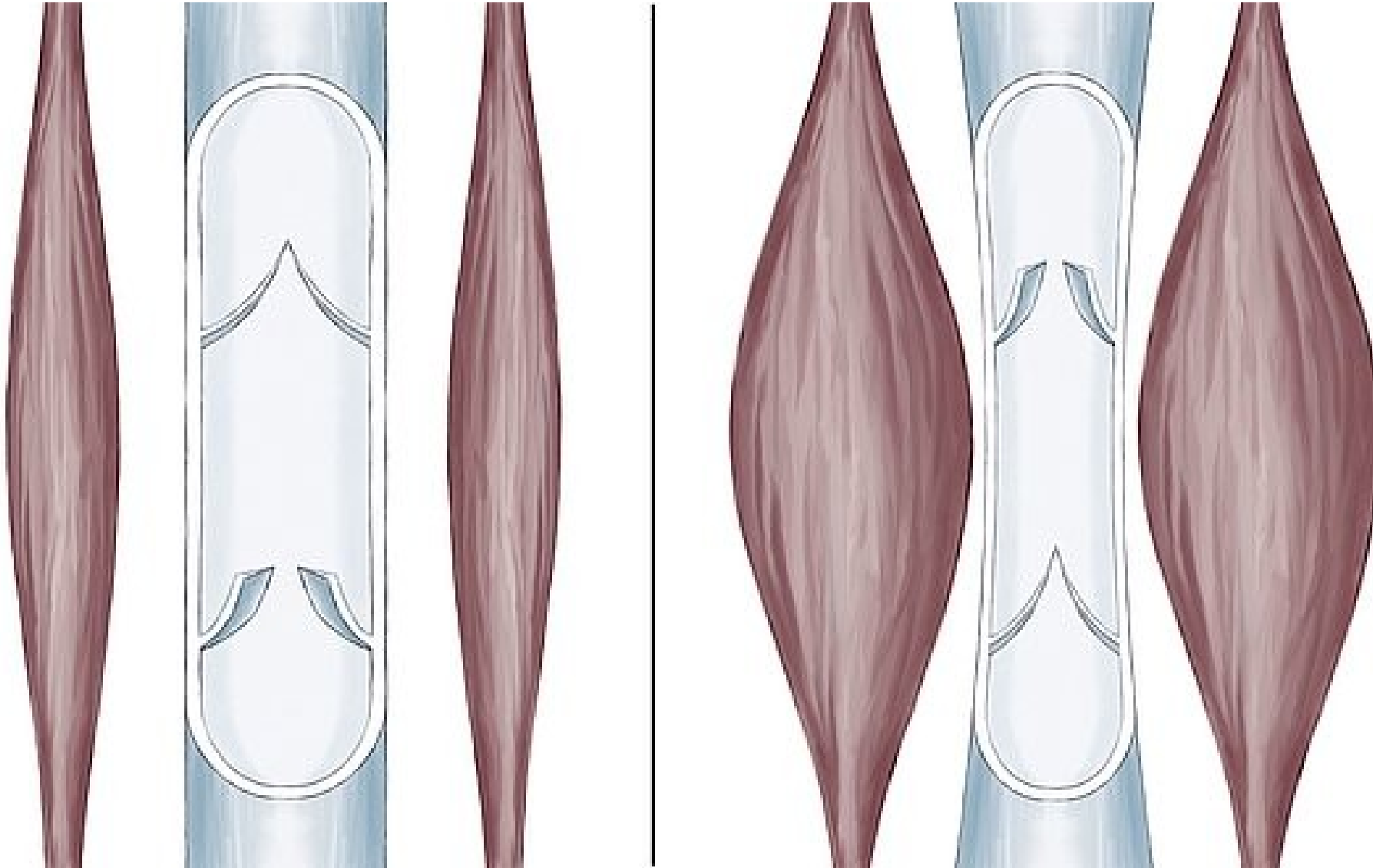
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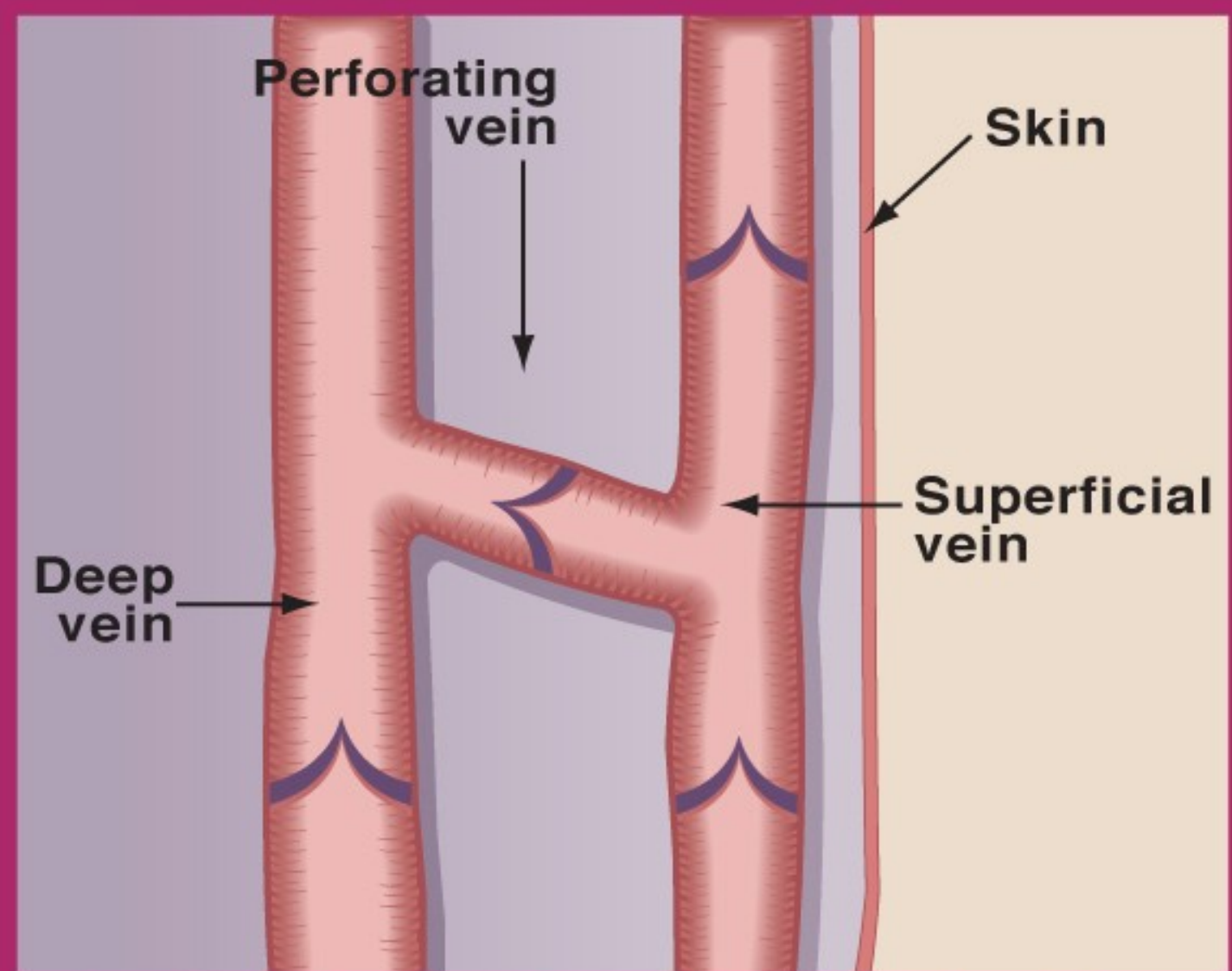
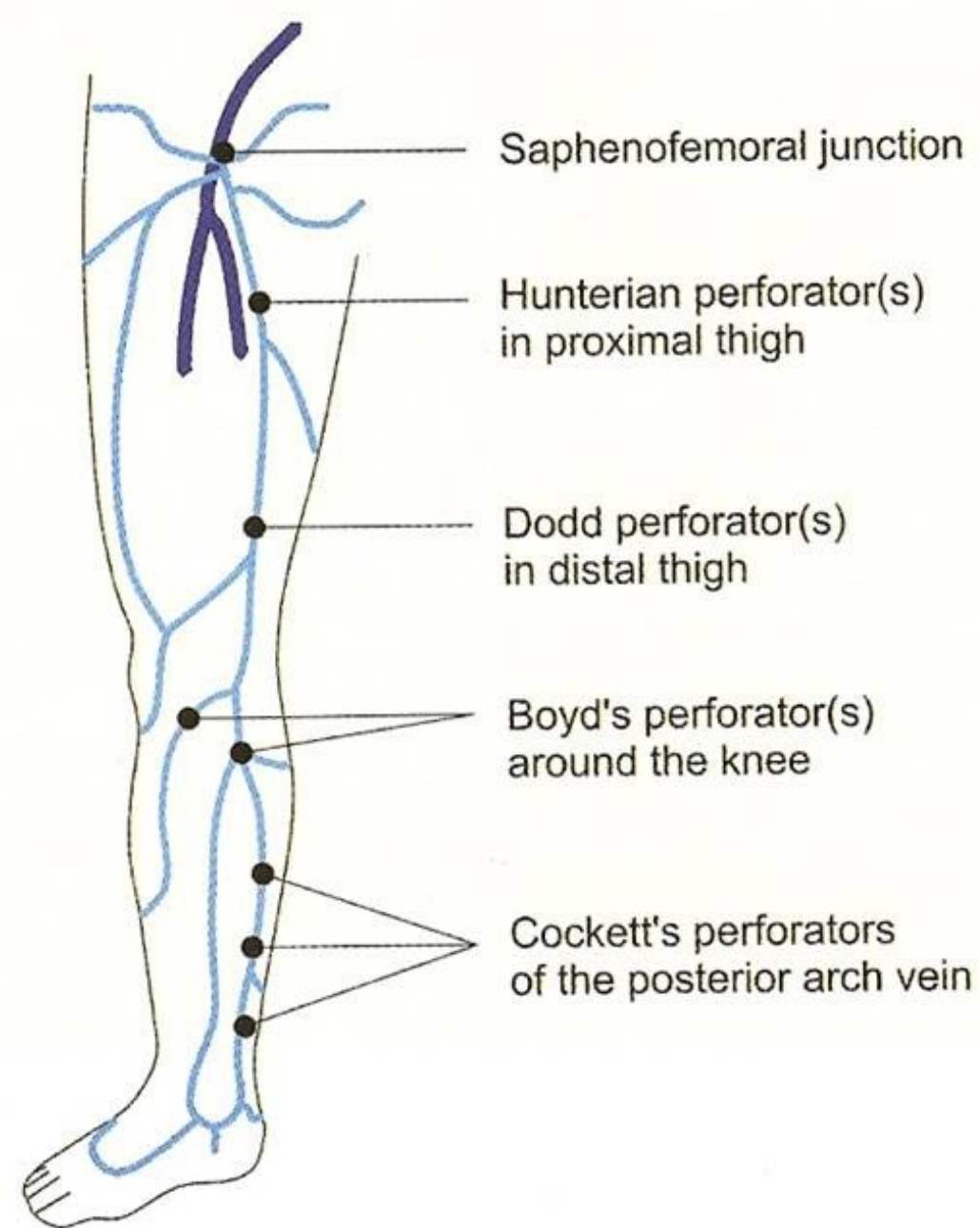
Venous Return in LL



- Much of the saphenous blood passes from superficial to deep veins through the perforating veins
- The blood is pumped upwards in the deep veins by the contraction of the calf muscle.
- This action of **'calf pump'** is assisted by the tight sleeve of deep fascia surrounding these muscles.

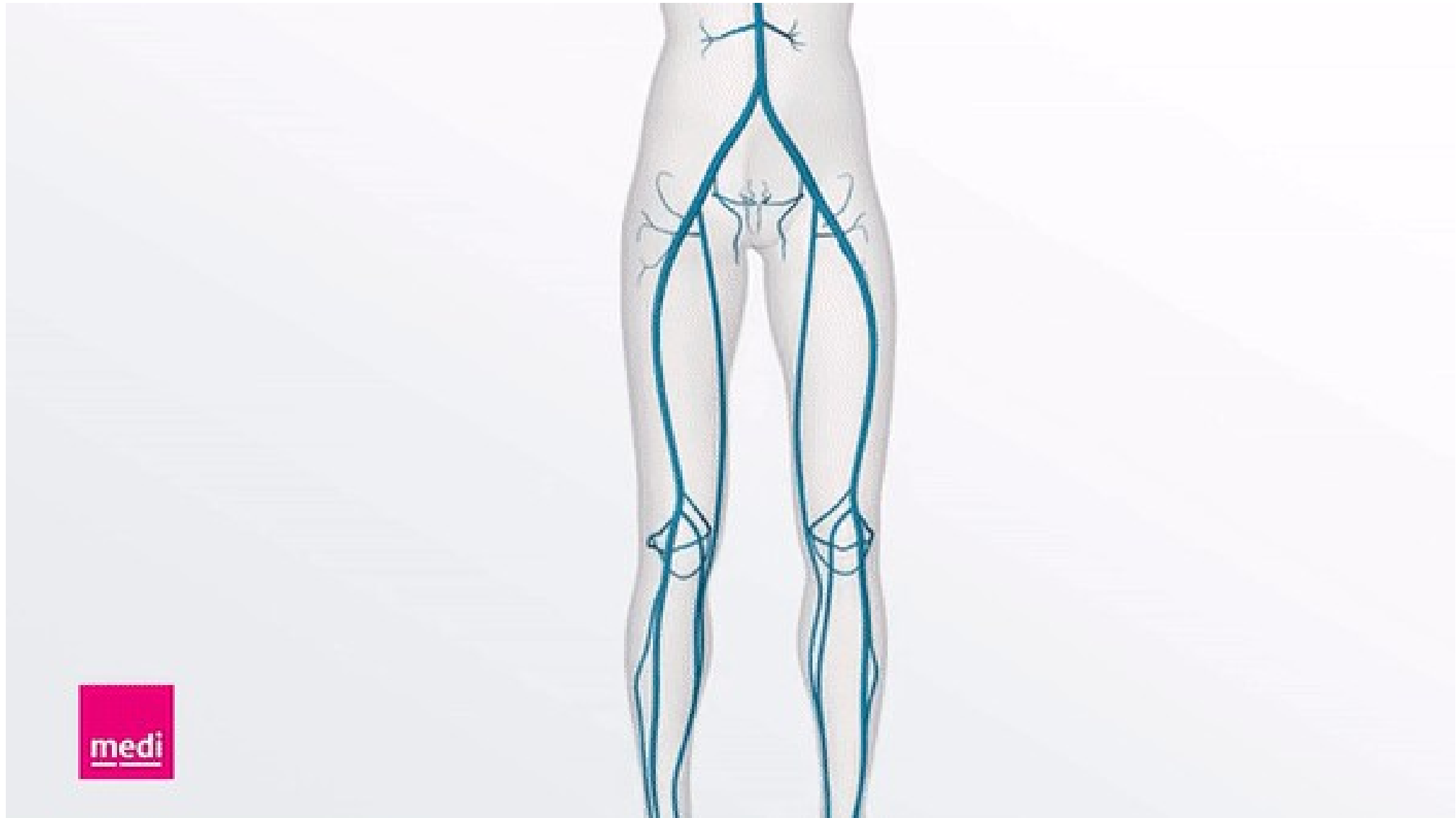
Venous Return in LL



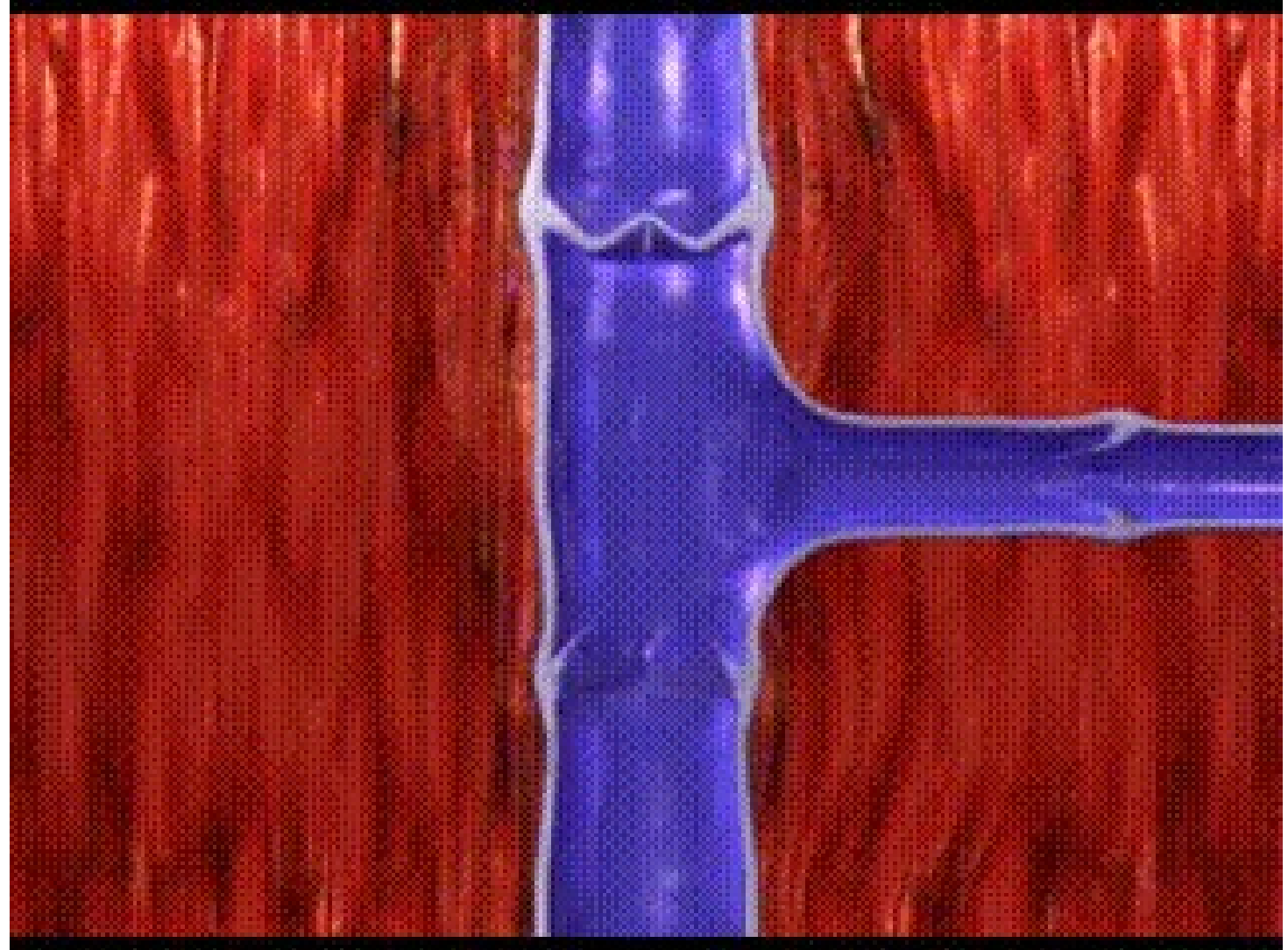
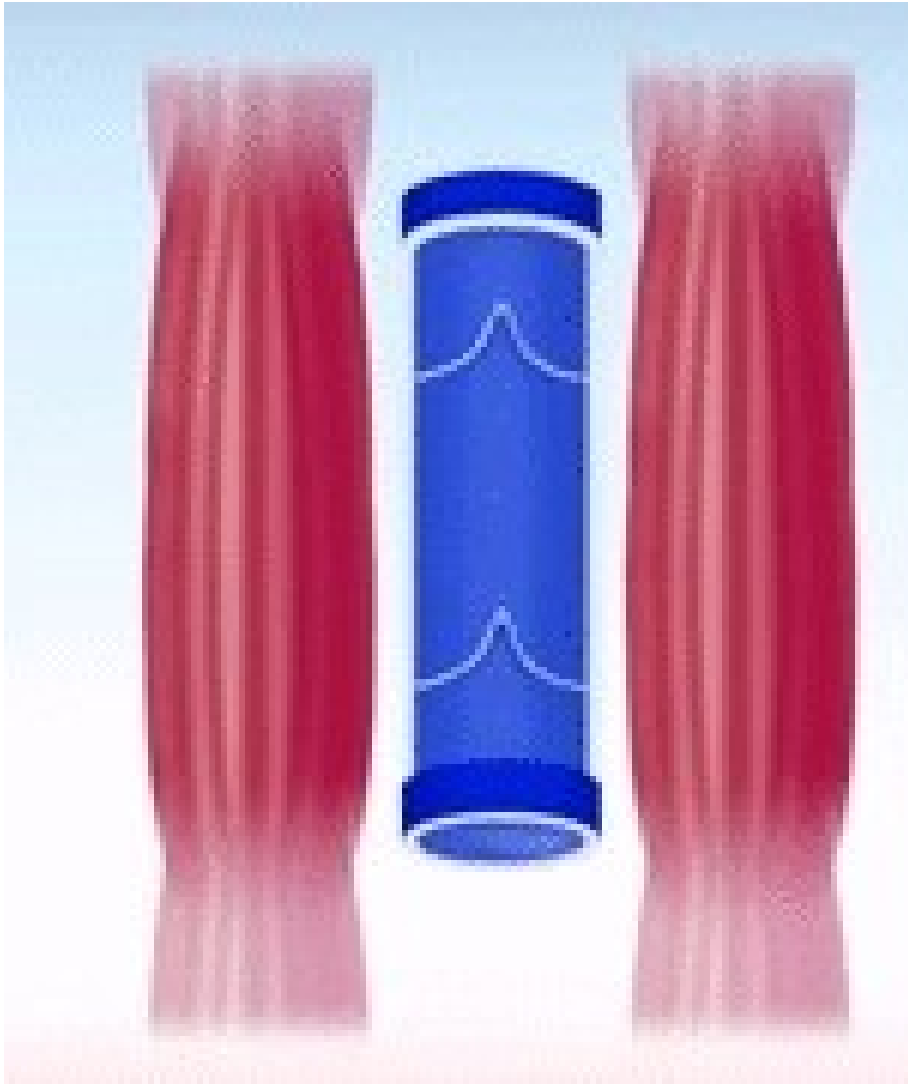


Perforating veins connect the deep system with the superficial system

Venous Return in LL



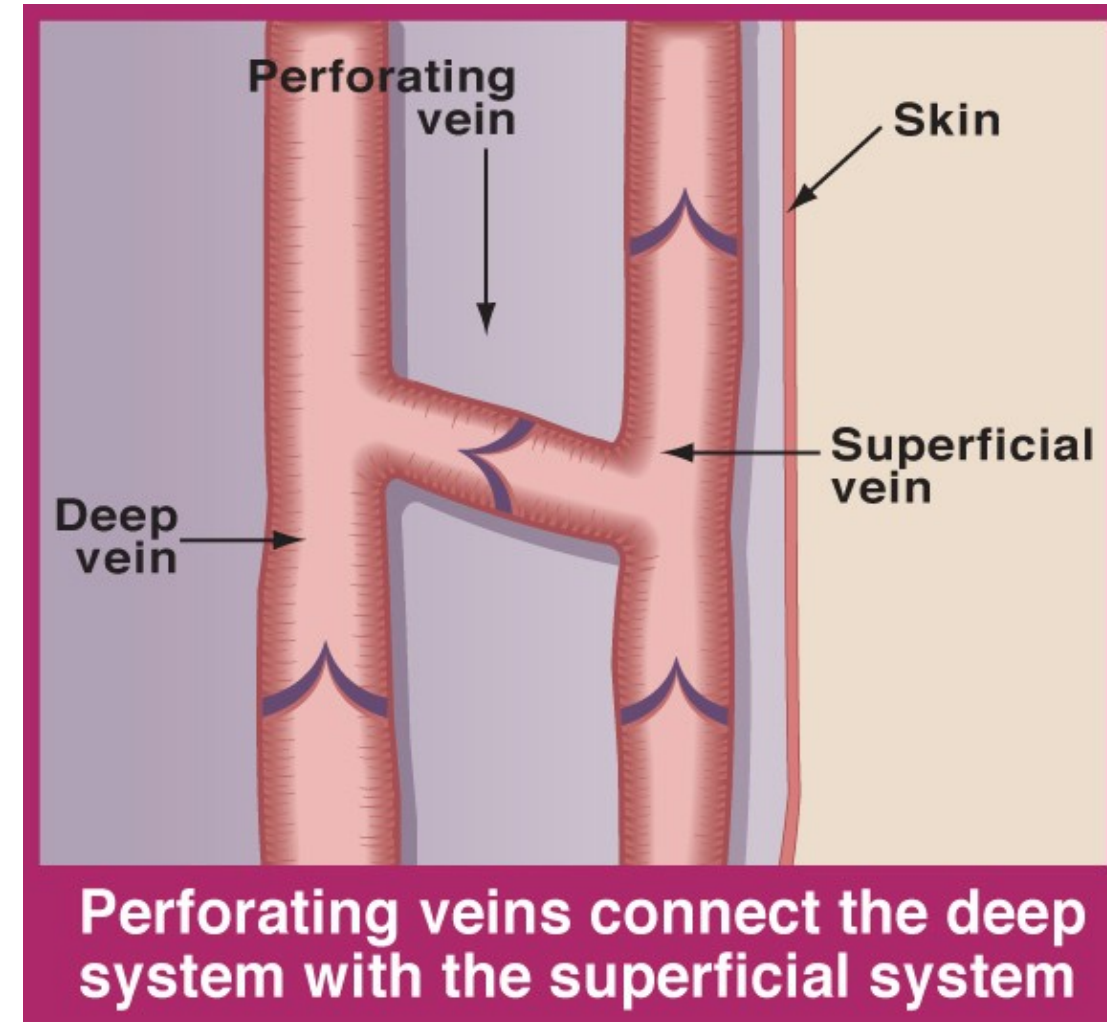
Venous Return in LL

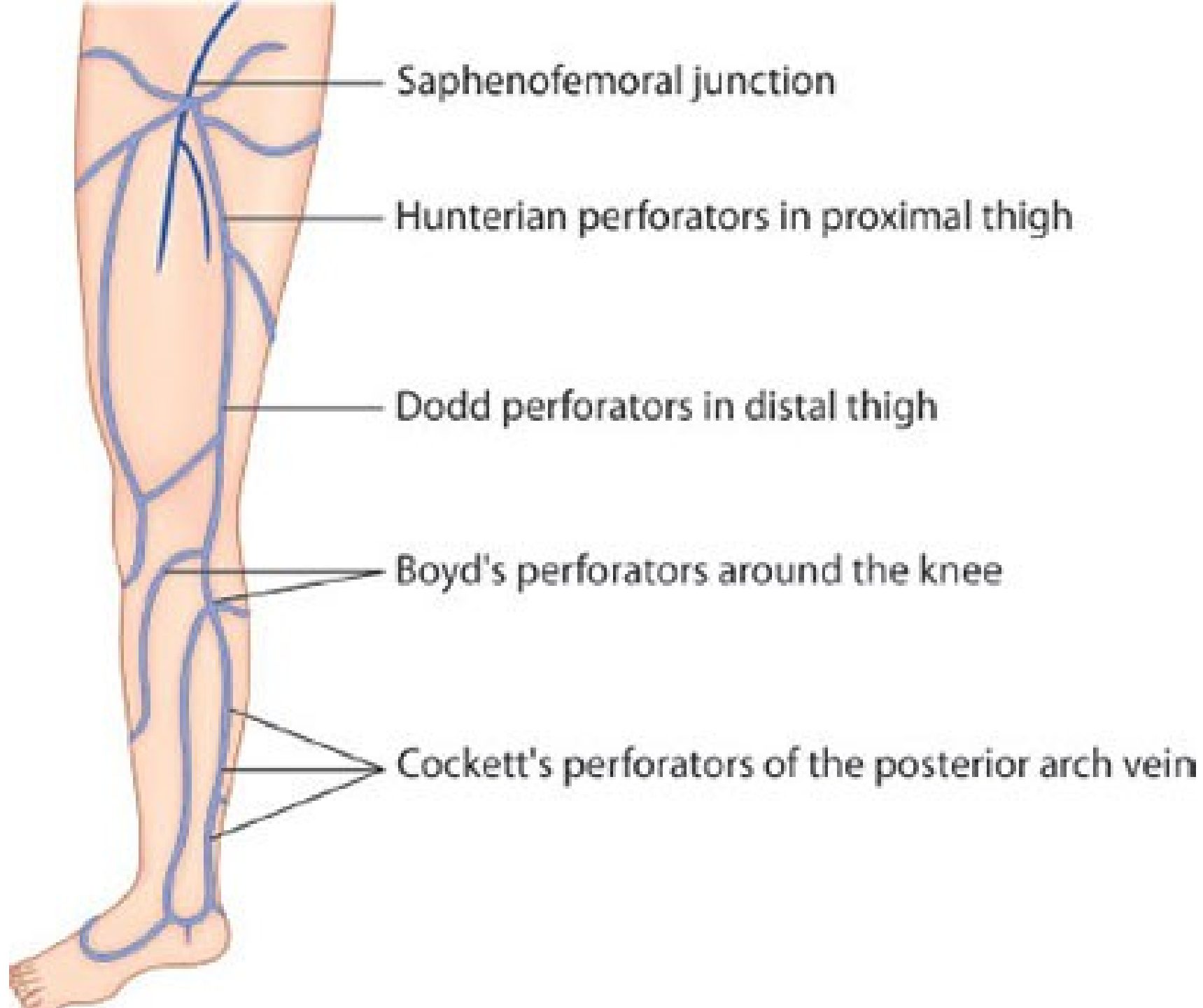


Lower Limb Perforators



- They contain valves which normally allow the blood to flow from superficial to deep veins.
- They pass through the deep fascia at an oblique angle so during muscular contraction, they are compressed. This also prevents blood flowing from the deep to the superficial veins..

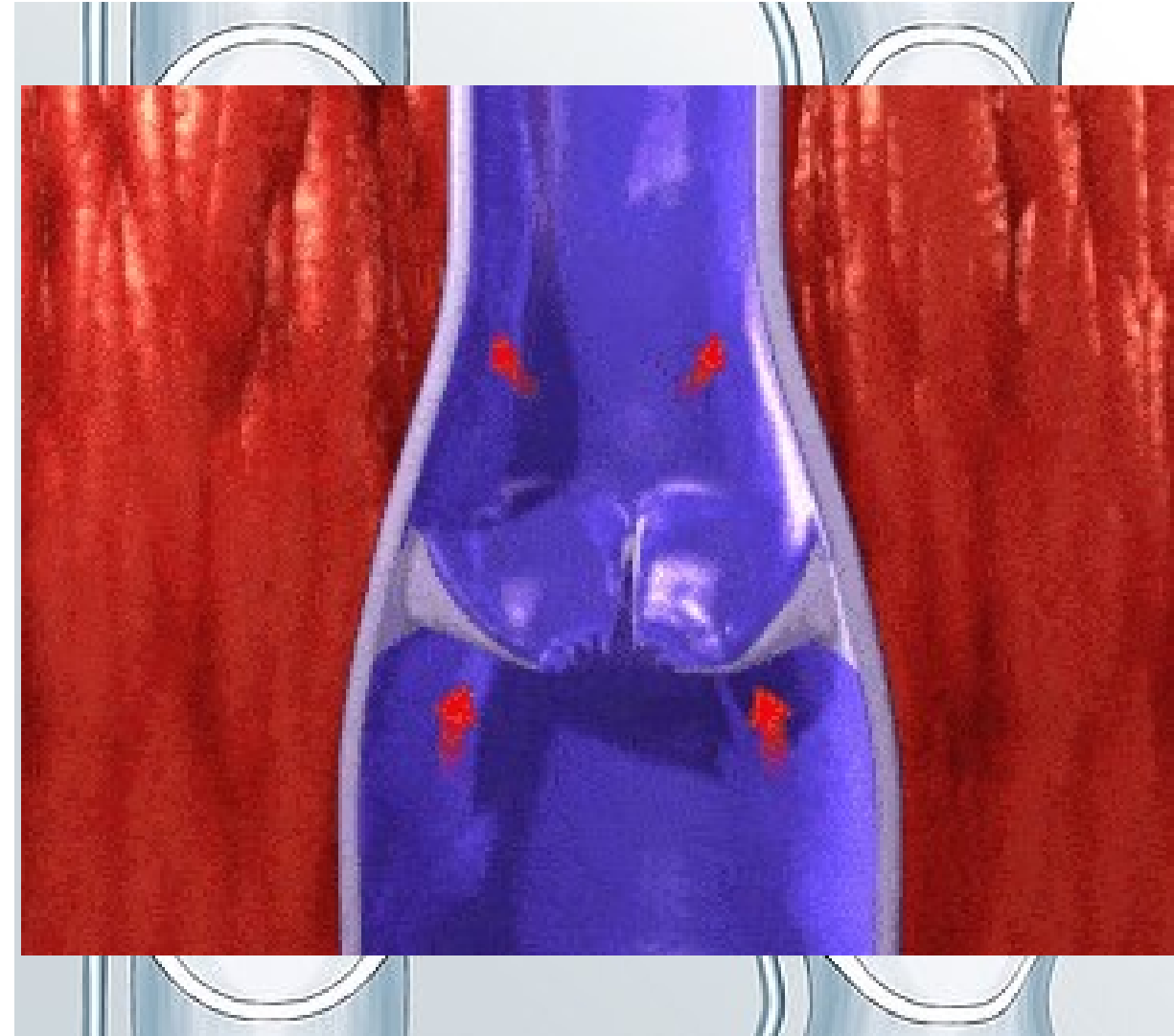


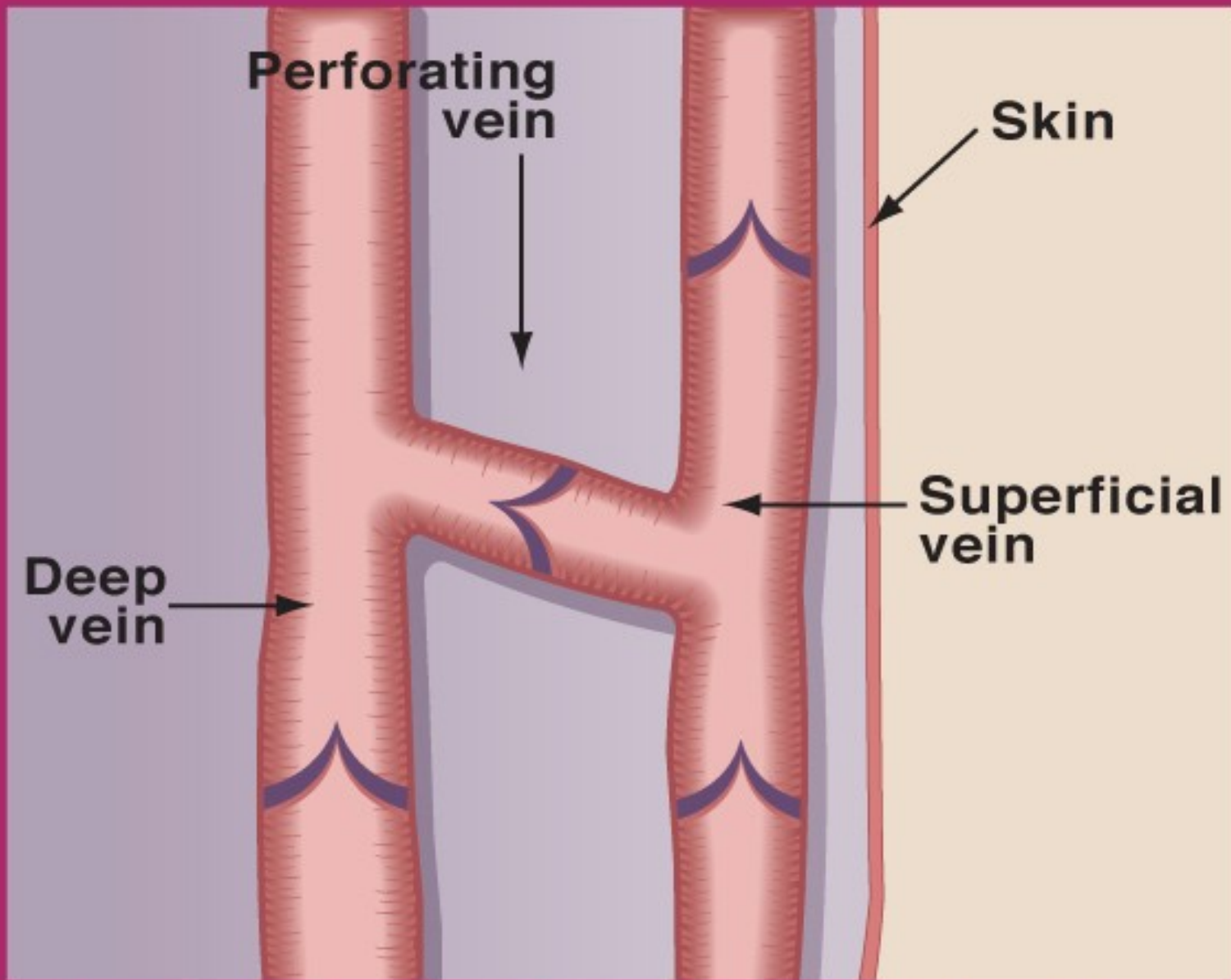


Varicose Veins



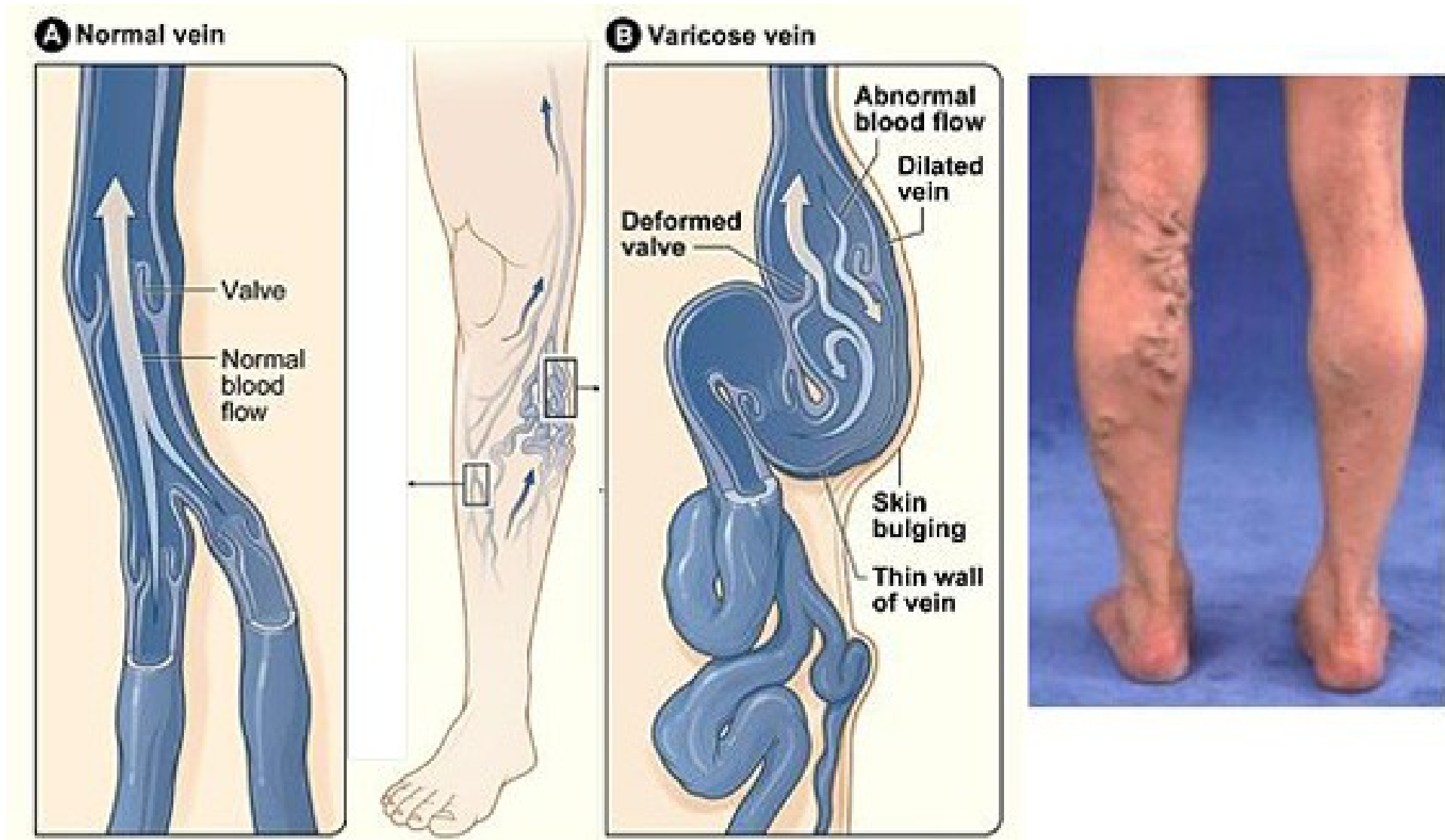
- If the valves in the perforating veins become incompetent, the direction of blood flow is reversed, and the veins become varicosed.
- Most common in posterior & medial parts of the lower limb, particularly in old people.
- This allows passage of high-pressure blood from deep to superficial veins.





Perforating veins connect the deep system with the superficial system

Venous Return in LL



Deep Veins of the LL



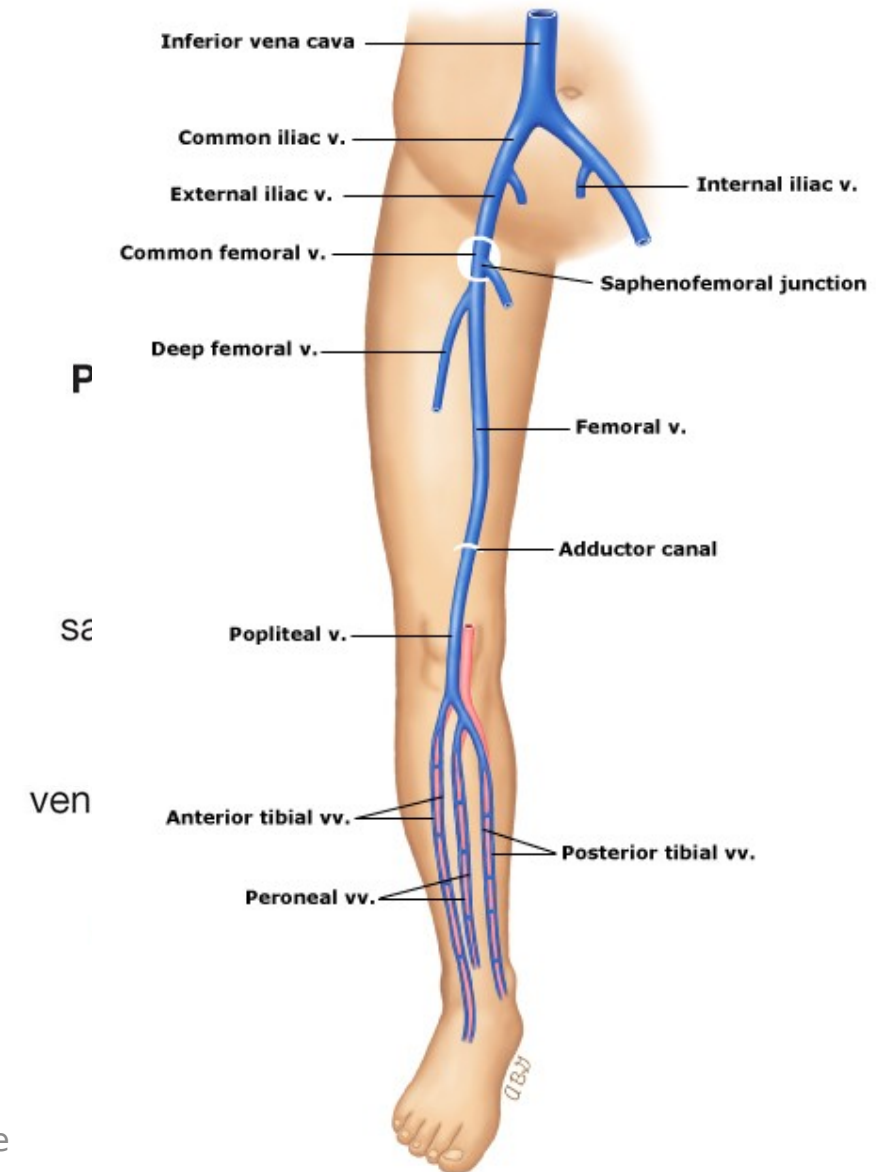
- Comprise the venae comitans, which accompany all the large arteries, usually in pairs.
- Venae comitans unite to form the popliteal vein, which continues as the femoral vein.
- Receive blood from superficial veins through perforating veins.

Deep Veins of the LL

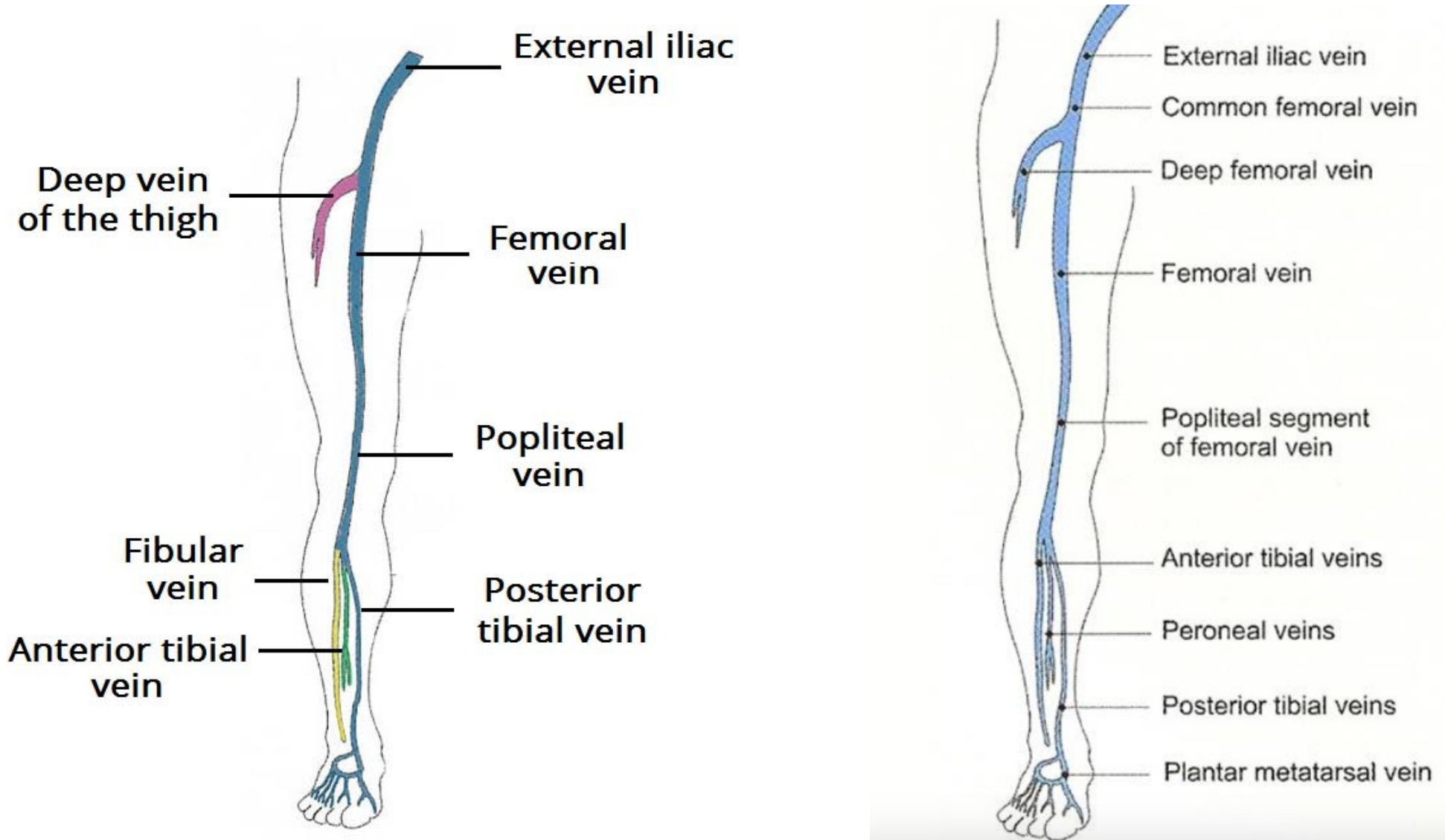


■ *Main deep veins of the lower limb include:*

1. **Femoral Vein - 1**
2. **Popliteal vein - 1**
3. **Peroneal vein - 1**
4. **Anterior tibial vein & Posterior tibial vein - 2**



Deep Veins of the LL



Popliteal Vein

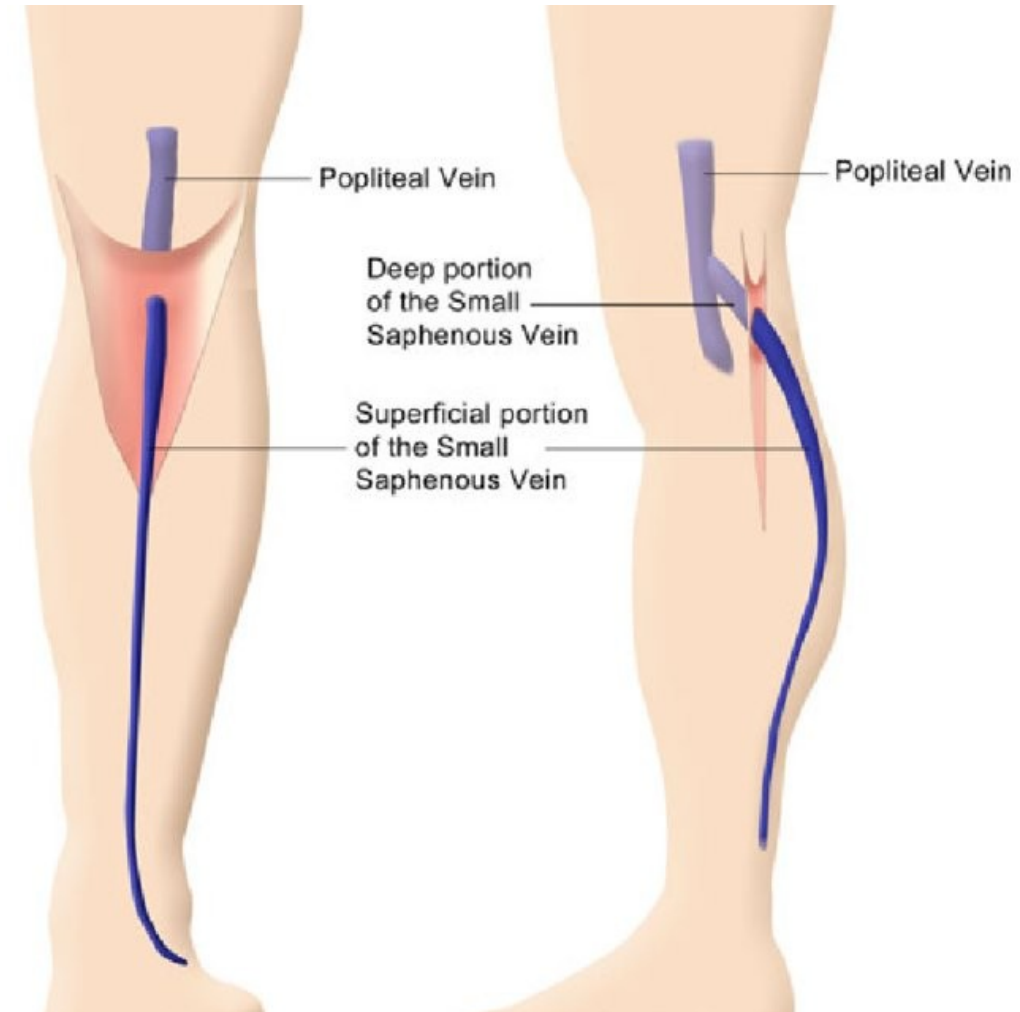


Beginning: at lower border of popliteus by union of venae comitantes of ant & post tibial art

Termination:- by passing via adductor hiatus & continues as femoral vein.

Tributaries:

1. Small saphenous vein.
2. Veins corresponding to the branches of the popliteal artery.
3. Muscular veins.



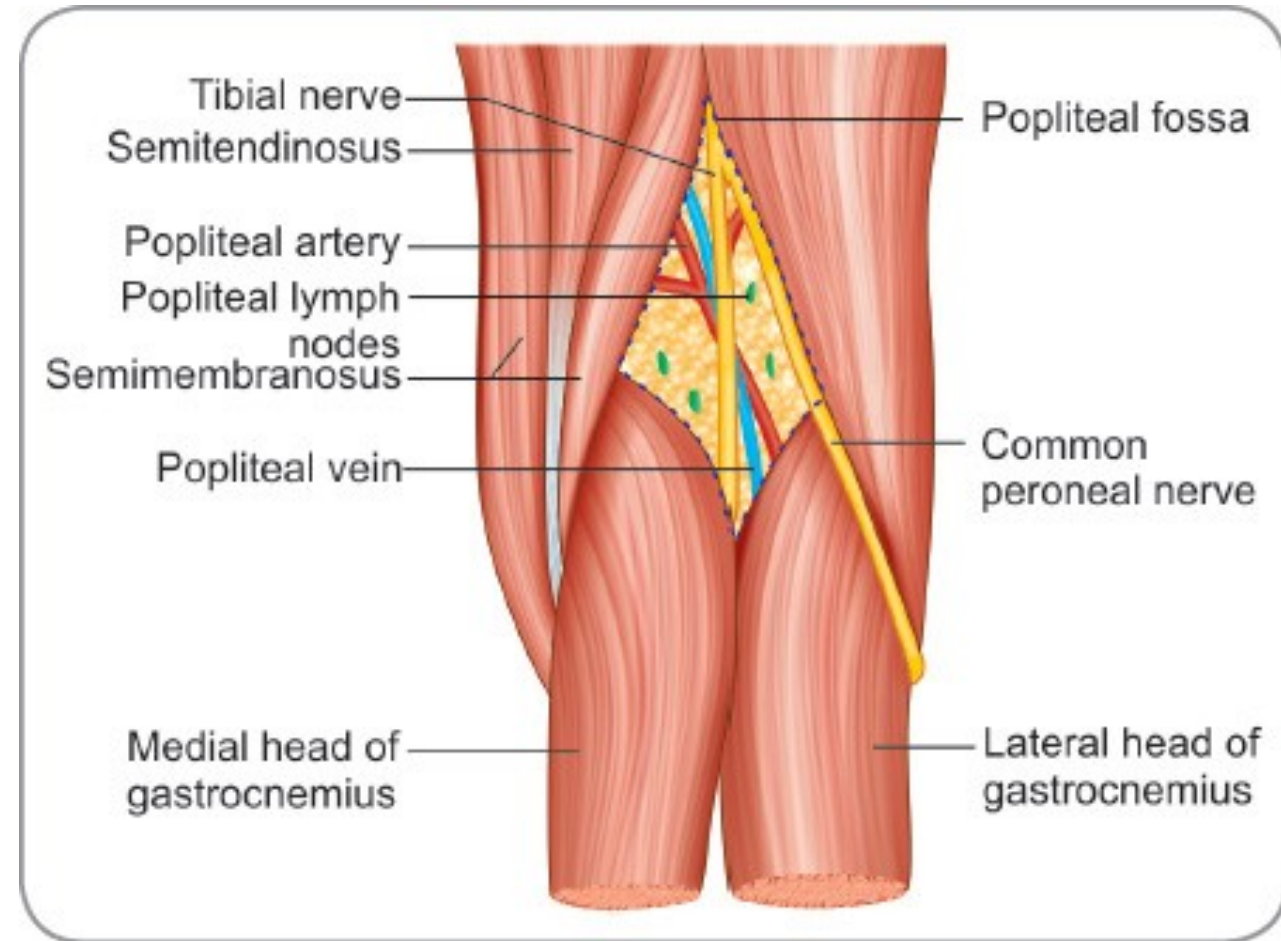
Popliteal Vein



Course and relations:

Has triple relations to the popliteal artery:

1. In **lower** part of the fossa: **medial** to artery.
2. In **middle** part of the fossa: **posterior** to it
3. In **upper** part of the fossa: **lateral** to the it.



Femoral Vein

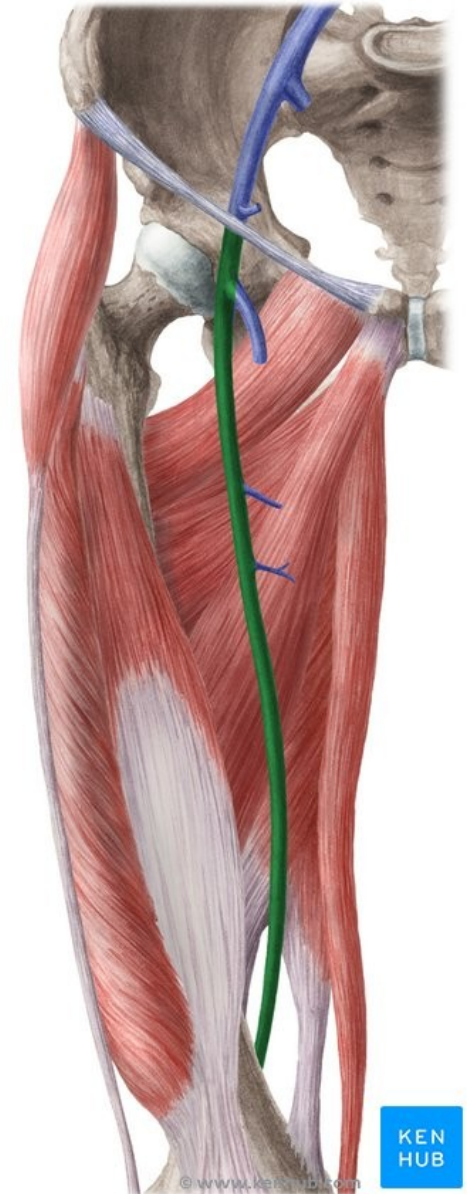


Beginning: continuation of popliteal vein through adductor hiatus.

Termination: continues as external iliac vein behind inguinal ligament medial to femoral *artery*.

Course and relations:

- 1. In the adductor canal** it ascends posterolaterally to the femoral artery then posterior to it.
- 2. In the femoral triangle** it passes posterior to become posteromedial then medial to the artery

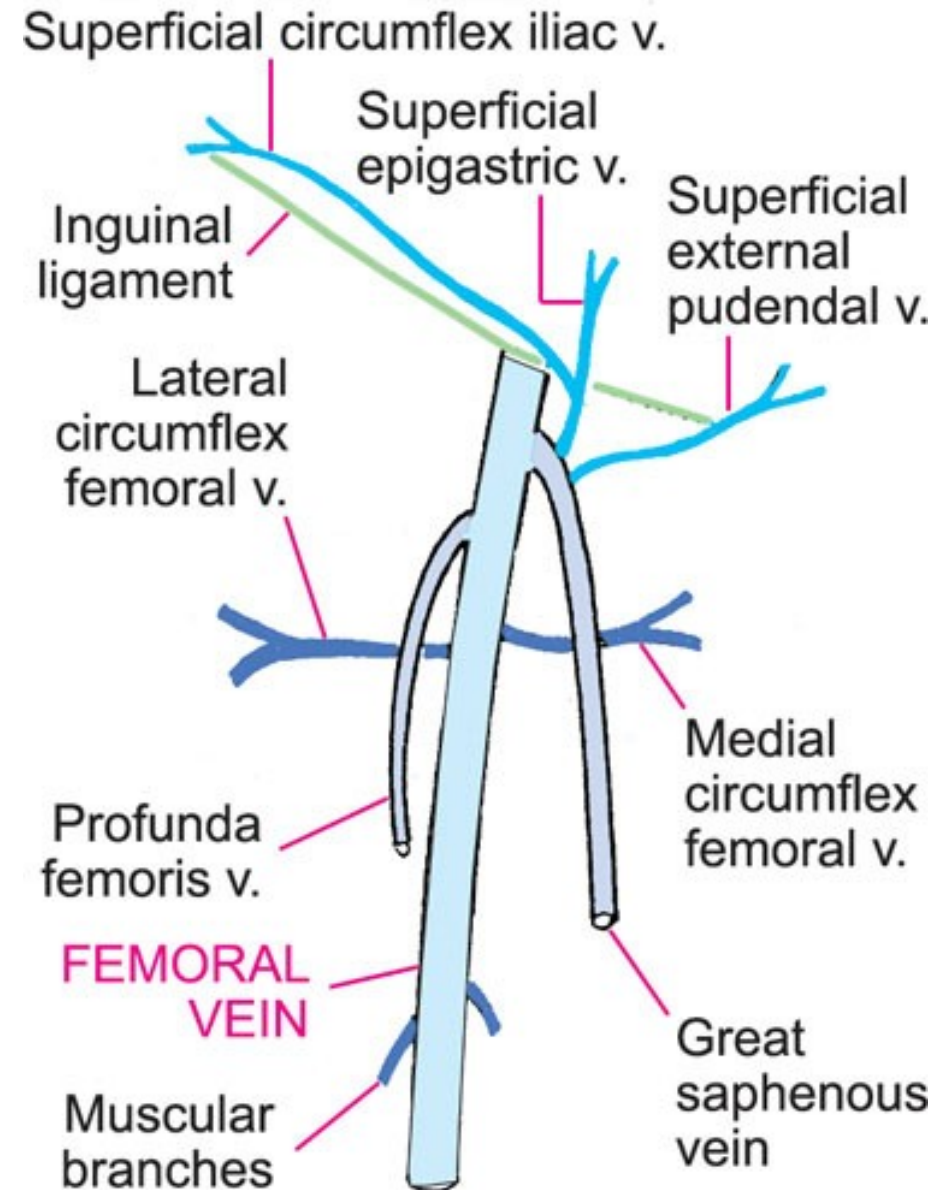


Femoral Vein



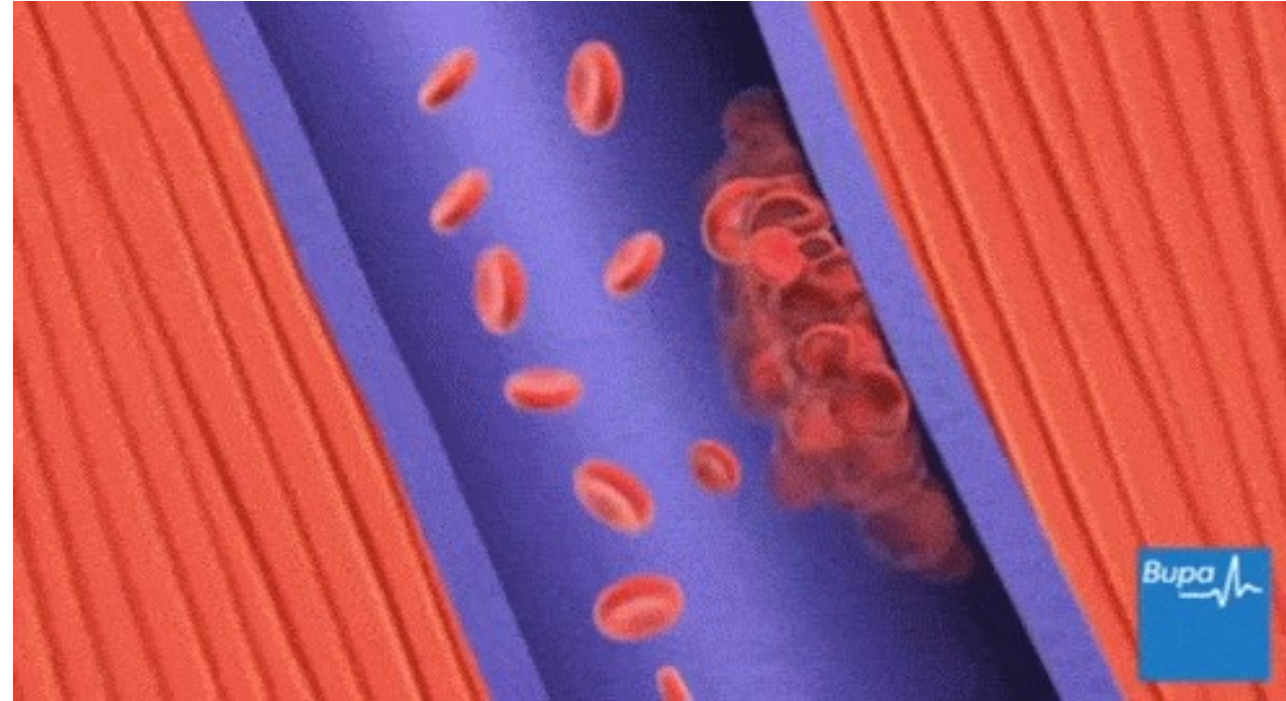
Tributaries:

1. Profunda femoris vein.
2. Medial and lateral circumflex femoral veins.
3. Deep external pudendal vein.
4. Great saphenous vein.
5. Muscular veins.



Deep Venous Thrombosis DVT

- The veins of lower limb are subject to venous thrombosis after a **bone fracture**.
- **Venous stasis** is the main cause by pressure on the veins from the bedding during **prolonged hospital stay**.
- **Pulmonary embolism** may occur when a thrombus breaks free from the lower limb vein and passes to the lungs.



Lecture Quiz



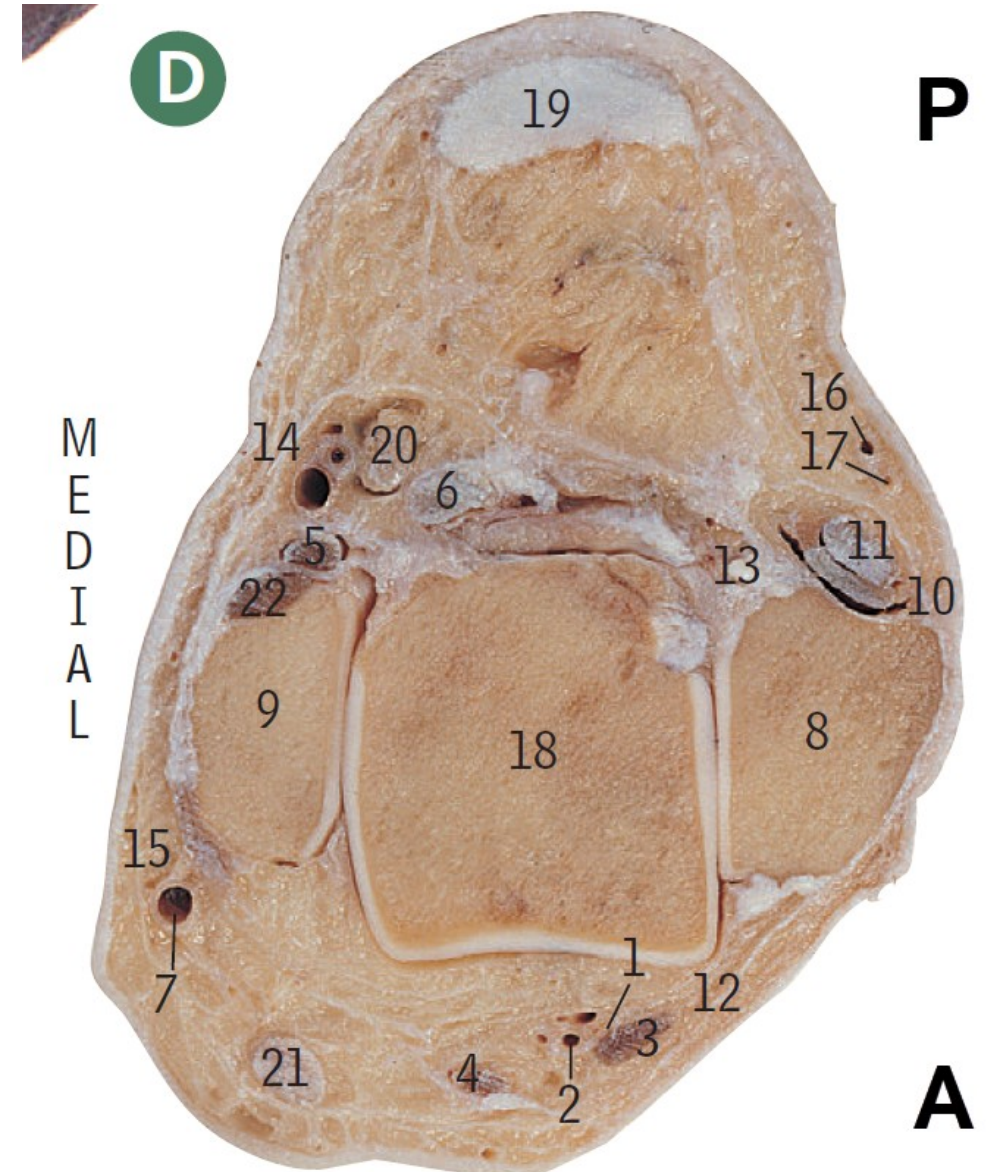
One of the following veins pass behind lateral malleolus:

- A. Great saphenous
- B. Short saphenous
- C. Peroneal
- D. Anterior tibial
- E. Popliteal

Lecture Quiz



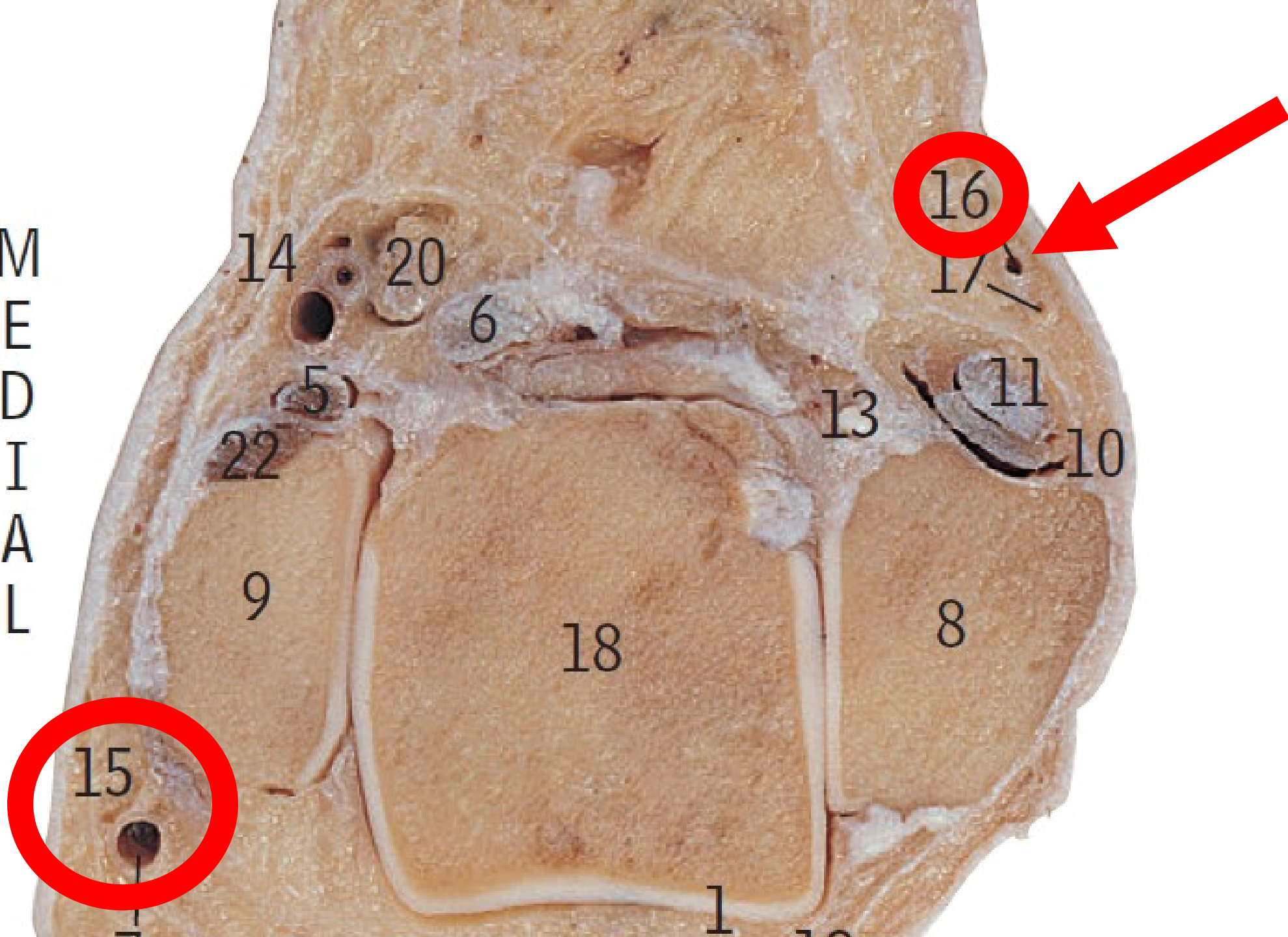
- ***Identify the great and small saphenous veins from the attached photo ...***



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D
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A
L

A



Suggested Readings



1. Gray's Anatomy for Students-4th Edition

2. Atlas of human anatomy by Frank H. Netter, 6th Edition

- For further inquiries **PLZ** feel free to contact at any time through email
- **gamaltaha@med.asu.edu.eg**



Thank You